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Evaluating university teaching and learning in an outcome-based model: replanting Bloom

Maureen Mary Morris
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Evaluating University Teaching and Learning in an Outcome-Based Model: Replanting Bloom

A thesis submitted in fulfilment of the requirements for the award of the degree

DOCTOR OF PHILOSOPHY

from the

UNIVERSITY OF WOLLONGONG

By

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School of Mathematics and Applied Statistics
2008
Declaration

In accordance with the regulations of the University of Wollongong, I, Maureen Mary Morris, declare that this thesis, submitted in fulfilment of the requirements for the award of Doctor of Philosophy in the School of Mathematics and Applied Statistics, University of Wollongong, is my own original work, except where due references are made. It has not been submitted for a degree at any other university.

Maureen Mary Morris
Abstract

This thesis was inspired by an experienced teacher’s desire to enhance student learning through implementation of a teaching/learning framework focused on promotion of higher order cognition. Two case studies document the construction, implementation and evaluation of learning frameworks for two disparate undergraduate university subjects.

Structurally, the thesis falls into three component parts. In the first, the researcher has reviewed the literature for an appropriate methodology, grounded her understanding of student learning through examination of relevant learning theories, canvassed suitable pedagogical strategies before construction of the teaching/learning frameworks, and devised an evaluation framework. In the second part, the two case studies have been described and in the final part, the threads of evidence have been drawn into the conclusion.

Action research afforded an appropriate methodology for the study. It offered facility for a spiral of implementation, review and re-implementation. Bound as a practitioner by the pragmatic perspective of what works, the researcher engaged multiple methodologies (grounded research encompassing elements of phenomenology and ethnography) in both case studies. She adopted a mixed method approach, with evidence derived from assessment data, survey responses, her annotated journal and comments from collaborating teachers and students.

The researcher’s primary intent was to construct aligned teaching/learning frameworks that promoted contextualised thinking for students in the two disciplines. Judgment of the effectiveness of the resulting frameworks in enhancing student learning required a strict evaluative regimen.

Key issues percolated through the thinking of the researcher/teacher:

- *life-long learning*;
- *meta-cognition* and *deeper learning*; and
marking of assessment that recognises achievement of learning objectives, offers students task related feedback and does not merely represent an aggregation of marks for ranking of students along a curve. Therefore, strategies were included that fostered independent learning and promoted productive collaboration, while marking criteria formed the focus for aligning marking with the objectives.

The primary case study examined teaching and learning in a foundation course in statistics at the University of Wollongong in Australia. The intent was to foster statistical thinking in students. Experienced in the field, the teacher assumed an active role as a participant researcher. In consultation with discipline experts and innovative teachers, the researcher/teacher observed the existing environment for a single session (N=159). Learning objectives were then rigorously scrutinised and behaviourally reframed; objectives were specified for learning and assessment tasks; and marking criteria devised to scaffold student responses, check assessment for objective achievement and provide detailed and task related feedback. Thus the objectives formed the agents of constructive alignment.

Implementation of the selected strategies was tracked over the subsequent four sessions (cohorts ranging in size from 152 to 192 students). Evidence of student learning and the effectiveness of the framework was derived from:

- assessment marks and grades;
- deconstruction of assessment tasks and responses using the revised Bloom’s Taxonomy (Anderson and Krathwohl, 2001);
- student survey responses;
- teacher and marker survey responses;
- the researcher’s journal, annotated by collaborative teachers; and
- peer discussions.

Results have highlighted increases in mean marks in summative assessment accompanied by shifts to higher order cognitive demand in assessment tasks across the implementations. Furthermore, strong correlations between proportions of students reporting confidence in topic learning and exam performance have lent credence to the teacher’s claim that students know what they know and know what they do not know.
The aim of the second case study was the design and implementation of an aligned curriculum for a subject focused on promoting critical and evaluative thinking in undergraduate accounting students. Although not the teacher/researcher’s field of expertise, intense consultations with the subject designers produced behaviourally framed objectives and a teaching/learning framework that targeted the desired skills. This case study consisted of a single implementation (N=223). Results were not conclusive, but examination of the detail has provided fresh insight into the potential value of peer evaluation and student portfolios to address the desired thinking.

Comparison of the two case studies has highlighted the marked similarity between the teacher’s expectations of statistical thinking, which underpins the University of Wollongong subject, and critical and evaluative thinking, which underpins the University of Western Sydney subject. ‘Structure’ has been identified as essential to successful implementation of the frameworks targeting discipline thinking. The structure of the desired thinking needs not only to be modelled but also to be recognised by students before it is effectively assimilated.

The researcher’s journey has required reflective practice that includes both telescopic and microscopic review of her thinking, her habits and the action and reaction occurring within her classroom. The evaluation of student learning undertaken in this thesis has formalised the teacher’s informal and intuitive response to the ostensibly absurd behaviours that take place as her students learn. Her deconstruction and interpretation of the apparent incongruities has at once affirmed past practice and inspired its renewal.
Acknowledgements

Although the onus of research is predicated on a journey of solitary thought, and the researcher is proud of her accomplishment, she acknowledges that this thesis has emerged in an environment redolent with support. She wishes to thank her supervisors for their encouragement, ideas and criticisms. Professor David Griffiths’ humour, intellect and expertise with a red pen have spurred this writer to aim high and to treat the English language with the respect it richly deserves. Dr Anne Porter is an inspired educator who has fired the researcher with her enthusiasm for teaching statistics and treated this teacher as a valued colleague.

Born of parents who perceived education and independent thought to be more precious than wealth, brother, Denis and sister, Colleen have fuelled the drive to gain the competitive edge in academic achievement. Their encouragement, founded in expectation and belief in my ability, has been immeasurable.

I thank my children who have come to view Bloom as an annoying cousin who came to dinner and refused to leave. A gifted writer, Patrick has served many hours in review of my ideas and now regards himself expert on Bloom’s taxonomy. Peter’s training as a teacher has both been supported by his secondment as an evaluator of my theoretical perspectives and repulsed by the volume of those ideas. My daughters Louise and Kate have shown great restraint in turning a blind eye to their mother’s housekeeping and have encouraged their eccentric mother in her academic pursuits. Louise’s assistance with typing is appreciated as the researcher acknowledges her ‘one finger’ entry of this entire thesis has been daunting.

I thank my husband who has long since lost touch with my ideas and become accustomed to an absent minded wife and the invading dust mites that occupy the vast piles of rejected copy.
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# Table of Contents

- Declaration .................................................. i
- Abstract ...................................................... ii
- Acknowledgements ......................................... v
- Table of Contents .......................................... vii
- Tables .......................................................... xvi
- Figures .......................................................... xviii

## Chapter 1

An Introduction

Informing practice: in pursuit of the elusive white rabbit

“Down the rabbit hole” *(Carroll, 2002, pp. 3-5)* 1

1.0 INSPIRATION: TEACHING IN WONDERLAND 3

1.0.1 Active teaching: a watching brief 3

1.0.2 Undertaking the quest 6

1.1 INTENTIONS 6

1.1.1 Research design: addressing the ’ologies 7

1.1.2 Defining learning 8

1.1.3 A blueprint for learning 9

1.1.4 Evaluation: a blueprint for detecting learning 10

1.2 RATIONALISATION 10

1.2.1 An innovation or a renovation? 11

1.2.2 A job worth doing? 12

1.2.3 At journey’s end? 12

1.3 FRAMING THE PURPOSE: AIMS AND OBJECTIVES 12

1.4 ORGANISING THE NARRATIVE 14

## Chapter 2

Methodology: A case to answer?


2.0 QUALITATIVE RESEARCH: A VIEW FROM INSIDE THE RAT’S MAZE 16
Chapter 3
Learning: Now you see it…or do you?

Tweedledum and Tweedledee (Carroll, 2002, pp.161-163)
3.0 WHAT IS LEARNING?
3.1 LEARNING THEORIES
  3.1.1 Behaviourism
  3.1.2 Cognitive learning theory
  3.1.3 Constructivist theory
  3.1.4 And deeper still: Co-constructivist theory
  3.1.5 Experiential learning
  3.1.6 Finding a paradigm: an eclectic compromise?
3.2 LEARNING TAXONOMIES
  3.2.1 Bloom’s Taxonomy
  3.2.2 SOLO Taxonomy
  3.2.3 A contextualised approach to classification?
3.3 LEARNING STYLES
3.4 STATISTICAL LEARNING
  3.4.1 Defining the learning
  3.4.2 Classifying the learning
Chapter 4

Teaching for learning: as easy as falling off a horse!

“It’s my own invention” (Carroll, 2002, p. 208)

4.0 INSTRUCTING TO CONSTRUCT DESIRED LEARNING

4.1 DEFINING CONCEPTS

4.1.1 Meta-cognition

4.1.2 Deeper learning

4.1.3 Organisers

4.1.4 Scaffolding

4.1.5 Alignment

4.2 ASSESSMENT

4.2.1 Awarding marks and grades: summative assessment

4.2.2 Informing students: formative assessment

4.2.3 Norm versus criterion based assessment

4.2.4 Assessing specific learning: critical thinking

4.2.5 Assessing learning in statistics

4.3 CONSTRUCTING LEARNING

4.3.1 Collaborative learning

4.3.2 Technology

4.3.3 Authentic tasks

4.3.4 Active participation

4.3.5 Motivation

4.3.6 Marking criteria

4.3.7 Feedback

4.3.8 Learning portfolios

4.3.9 Peer evaluation

Chapter 5

Evaluation

Learning from teaching: Looking for atoms of meaning

“Alice’s evidence” (Carroll, 2002, pp. 104-105)
5.0.1 Situating the researcher
5.0.2 What happened and how do we know it?
5.0.3 Trees from the wood? Chasing atoms of meaning

5.1 PROGRAM EVALUATION
5.1.1 Evaluation models
5.1.2 The Context Input Process Product Model
5.1.3 Metfessel-Michael Paradigm
5.1.4 A Four stage evaluation of teaching and learning
5.1.5 An evaluation model for educational innovations

5.2 DEVELOPING A MODEL FIT TO PURPOSE
5.2.1 Logic behind the program: mapping perspectives
5.2.2 Focusing the evaluation
5.2.3 Evaluation criteria: the search for atoms of meaning
5.2.4 An adapted evaluation model

5.3 THE TEACHING/LEARNING FRAMEWORK: SUB-ATOMIC EVIDENCE

Chapter 6
Case Study
Doing the sums- improving a student’s perspective of statistics

“Queen Alice” (Carroll, 2002, p. 221)

6.0 BACKGROUND
6.0.1 A need to encourage more students in the study of statistics
6.0.2 An aim for the study
6.0.3 A methodology

6.1 DESCRIPTIVE DETAIL
6.1.1 A time and place…
6.1.2 Working with experts
6.1.3 Working with novices
6.1.4 Content and skills

6.2 AN EXISTING INFRASTRUCTURE
6.2.1 Lectures
6.2.2 Laboratory classes
6.2.3 Assessment
6.2.4 Evaluation
6.2.5 Learning to tread in expert footsteps
6.3 PROMOTING LEARNING: ENHANCING THE FRAMEWORK  150
   6.3.1 Defined learning outcomes  151
   6.3.2 Marking guides as agents of scaffolding and feedback  152
   6.3.3 Collaborative Learning  153
   6.3.4 Experiential Learning  155
   6.3.5 Authentic Tasks  155
   6.3.6 The laboratory manual as a portfolio of learning  155
6.4 A SUBJECT IN PARALLEL  157
6.5 EVALUATION STRATEGY  157
   6.5.1 Describing the evaluand  158
   6.5.2 Seeking evidence: the annotated journal  159
   6.5.3 Seeking evidence: peer review  159
   6.5.4 Seeking evidence: student surveys  160
   6.5.5 Seeking evidence: student assessment  163
6.6 TRACKING THE EVIDENCE: THE TEACHING/LEARNING FRAMEWORK  164
   6.6.1 The impact of lectures on student learning  166
   6.6.2 The impact of laboratory classes on student learning  167
   6.6.3 The impact of the laboratory manual on student learning  167
   6.6.4 The impact of laboratory tasks on student learning  168
   6.6.5 The impact of the solutions on student learning  170
   6.6.6 The impact of the assignments on student learning  172
   6.6.7 The impact of the lecture notes on student learning  176
   6.6.8 The impact of the marking guides on student learning  177
   6.6.9 The impact of the midterm on student learning  178
   6.6.10 The impact of the online lecture notes on student learning  179
   6.6.11 The impact of teamwork on student learning  179
   6.6.12 The impact of the tutor on student learning  180
   6.6.13 The impact of the learning strategies on student learning  181
   6.6.14 The impact of the specified objectives on student learning  182
   6.6.15 The impact of the online forums on student learning  182
   6.6.16 The impact of the text book on student learning  183
   6.6.17 Students’ general comments  183
6.7 TRACKING THE EVIDENCE: OVERALL LEARNING  184
   6.7.1 The students’ perspective: discipline learning  184
   6.7.2 The students’ perspective: graduates attributes  185
   6.7.3 The students’ perspective: overall learning  187
   6.7.4 The teacher’s perspective: the marks  188
6.7.5 From the researcher/teacher’s perspective: the exams

6.8 CONCLUSIONS

6.8.1 Achievements

6.8.2 Deficiencies highlighted during the implementation

6.9 NEW PATHS TO TREAD

6.9.1 Peer review and its impact upon meta-cognition

6.9.2 Timing is of the essence!

6.9.3 Classifying learning: working backwards

Chapter 7
Case Study
Making sense of nonsense – an excursion into critical thinking

“The Mock-Turtle’s Story” (Carroll, 2002, p. 78)

7.0 BACKGROUND

7.0.1 Uncharted territories

7.0.2 Answering the critics

7.0.3 A dilemma: addressing shallow learning in accounting students

7.0.4 Setting aims for the study

7.0.5 A methodology

7.1 ENVIRONMENTAL DETAIL

7.1.1 The teachers

7.1.2 The students

7.1.3 The subject delivery

7.1.4 The assessment regimen

7.2 DEFINING THE LEARNING

7.2.1 Deeper learning

7.2.2 Defining the subject learning outcomes

7.3 A PEDAGOGICAL FACELIFT

7.3.1 Scaffolding learning: rejuvenating tutorial classes

7.3.2 Promoting learning: engagement in meaningful tasks

7.3.3 Promoting learning: collaboration

7.3.4 Promoting learning: peer evaluation

7.3.5 Promoting learning: portfolios

7.4 REFINING THE ASSESSMENT

7.4.1 The assessment structure
7.4.2  The marking criteria

7.5 EVALUATION: SEEKING EVIDENCE
7.5.1  Student surveys
7.5.2  Student assessment
7.5.2  Peer review

7.6 CHECKING THE LEARNING: STUDENT SURVEY
7.6.1  Student survey: attendance patterns
7.6.2  Student survey: importance of subject presentation to learning
7.6.3  Student survey: perception of learning
7.6.4  Student survey: topic learning
7.6.5  Student survey: perceptions of achievement of subject outcomes
7.6.6  Student survey: experience of group work

7.7 ASSESSMENT
7.7.1  Formative assessment
7.7.2  Summative assessment

7.8 REFLECTIVE DISCUSSION: IMPACTING ON STUDENT LEARNING
7.8.1  Deeper learning
7.8.2  Collaborative learning
7.8.3  Peer evaluation
7.8.4  Student portfolios
7.8.5  Active student engagement
7.8.6  Marking criteria
7.8.7  Alignment through the objectives

7.9 CONCLUSION

Chapter 8
Conclusions

“All in golden afternoon” (Carroll, 2002)

8.0 REVISITING THE EVIDENCE
8.0.1  Focused teaching
8.0.2  Enhanced learning
8.0.3  Aligned assessment
8.0.4  Constructive alignment
8.0.5  Statistical thinking
8.0.6  Critical and evaluative thinking
8.1 FUTURE EXPLORATION 242
  8.1.1 Classifying learning 242
  8.1.2 Transparent objectives 243
  8.1.3 Supported learning 244
  8.1.4 Assessing learning 245
  8.1.5 Evaluating the learning experience 246

8.2 IMPROVING LEARNING BY IMPROVING TEACHING 247

REFERENCES 250

APPENDICES 269
  3.1a Table of classifications of ‘lower order’ knowledge types and cognitive processing skills according to the revised Bloom’s Taxonomy 269
  3.1b Table of classifications of ‘higher order’ knowledge types and cognitive processing skills according to the revised Bloom’s Taxonomy 270
  3.2 Models of Statistical Reasoning 271
  5.1 The Metfessel-Michael Paradigm 272
  5.2 The Four Step Evaluation Model 274
  5.3 An integrated evaluation framework (adapted from Alexander & Hedberg, 1994) 275

6.1 STAT131: Aspects of lectures and associated student survey responses across all implementations 278
  6.2 STAT131: Aspects of lab classes and associated student survey responses across all implementations 279
  6.3 STAT131: Aspects of lab manual and associated student survey responses across all implementations 281
  6.4 STAT131: Aspects of lab tasks and associated student survey responses across all implementations 283
  6.5 STAT131: Aspects of solutions and associated student survey responses across all implementations 284
  6.6 STAT131: Aspects of assignments and associated student survey responses across all implementations 285
  6.7 STAT131: Aspects of lecture notes and associated student survey responses across all implementations 286
  6.8 STAT131: Aspects of marking guides and associated student survey responses across all implementations 287
  6.9 STAT131: Aspects of midterm and associated student survey responses across all implementations 288
  6.10 STAT131: Aspects of online lecture notes and associated student survey responses across all implementations 289
  6.11 STAT131: Aspects of teamwork and associated student survey responses across all implementations 290
  6.12 STAT131: Aspects of tutor and associated student survey responses across all implementations 291
  6.13 STAT131: Aspects of learning strategies and associated student survey responses across all implementations 292
  6.14 STAT131: Aspects of objectives and associated student survey responses across all implementations 293
  6.15 STAT131: Aspects of forum and associated student survey responses across all implementations 294
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.16</td>
<td>STAT131: Aspects of text and associated student survey responses across all implementations</td>
</tr>
<tr>
<td>6.17</td>
<td>STAT131: Facets of the teaching/learning framework and student survey responses to perceived importance to learning across all implementations</td>
</tr>
<tr>
<td>6.18</td>
<td>STAT131: Changing aspects of student evaluation surveys across all implementations</td>
</tr>
<tr>
<td>6.19</td>
<td>STAT131: Proportions of students responding as moderately confident or confident in topic learning across all implementations</td>
</tr>
<tr>
<td>6.20</td>
<td>STAT131: Percentages of students believing they made progress toward achievement of the graduate attributes across surveyed implementations</td>
</tr>
<tr>
<td>6.21</td>
<td>STAT131: Descriptives for all assessment across all implementations</td>
</tr>
<tr>
<td>6.22</td>
<td>Final exam marks: Significant post hoc comparisons of paired means for final marks (equal variances not assumed – Tamhane and Dunnett T3)</td>
</tr>
<tr>
<td>6.23</td>
<td>Final exam marks: Significant post hoc comparisons of paired means for final marks (equal variances assumed – Bonferroni)</td>
</tr>
<tr>
<td>6.24</td>
<td>Percentages of students reporting progress in achievement of graduate qualities by thinking statistically</td>
</tr>
<tr>
<td>6.25</td>
<td>A sample student survey used in spring 2005</td>
</tr>
<tr>
<td>6.26</td>
<td>Percentage of marks allocated to questions on bivariate relationships (regression/correlation) in the autumn 2003 final exam (classified using the revised taxonomy of Bloom)</td>
</tr>
<tr>
<td>6.27</td>
<td>Percentage of marks allocated to questions on bivariate relationships (regression/correlation) in the autumn 2004 final exam (classified using the revised taxonomy of Bloom)</td>
</tr>
<tr>
<td>6.28</td>
<td>Percentage of marks allocated to questions on bivariate relationships (regression/correlation) in the autumn 2005 final exam (classified using the revised taxonomy of Bloom)</td>
</tr>
<tr>
<td>6.29</td>
<td>Classification of knowledge types and processing skills</td>
</tr>
<tr>
<td>6.30</td>
<td>Example of STAT131 Assignment 1</td>
</tr>
<tr>
<td>6.31a</td>
<td>Coding of examination questions (correlation of quantitative variables) using the revised taxonomy of Bloom (see Appendix 6.29) - Autumn Session 2003</td>
</tr>
<tr>
<td>6.31b</td>
<td>Coding of examination questions (correlation of quantitative variables) using the revised taxonomy of Bloom (see Appendix 6.29) - Autumn Session 2004</td>
</tr>
<tr>
<td>6.31c</td>
<td>Coding of examination questions (correlation of quantitative variables) using the revised taxonomy of Bloom (see Appendix 6.29) - Autumn Session 2005</td>
</tr>
<tr>
<td>7.1a</td>
<td>Subject presentation (lectures) before and after implemented changes with associated student survey responses (n=150)</td>
</tr>
<tr>
<td>7.1b</td>
<td>Subject presentation (tutorials) before and after implemented changes with associated student survey responses (n=150)</td>
</tr>
<tr>
<td>7.1c</td>
<td>Subject presentation (web resources) before and after implemented changes with associated student survey responses (n=150)</td>
</tr>
<tr>
<td>7.2</td>
<td>Subject assessment before and after implemented changes with associated student mark summaries (N=223)</td>
</tr>
<tr>
<td>7.3</td>
<td>Student subject evaluation survey</td>
</tr>
<tr>
<td>7.4</td>
<td>Spring 2005 Final Exam and teacher/marker comments</td>
</tr>
</tbody>
</table>
### Tables

1.1 Objectives of the case studies incorporated in this thesis | 13
2.1 Research paradigms | 21
2.2 Choices of Methodologies for the classroom studies | 27
2.3 Research design | 28
2.4 Addressing criteria for judging the quality of the qualitative research in this study | 34
3.1 Situating the researcher’s teaching/learning framework | 54
3.2 Condensed version of the Cognitive Domain of the Taxonomy of Educational Objectives | 58
3.3 Two-Dimensional Cross-Classification of Types of Knowledge by Cognitive Processing Skills | 59
3.4 Two-Dimensional Sub-classification of Conceptual Knowledge by Cognitive Processing Skill: Understand | 60
3.4 Isomorphic mapping of Piaget’s Stages of Cognitive development to the SOLO descriptions | 61
3.5 Classification of student responses to the above algebra questions using the SOLO taxonomy | 63
3.7 Classifying statistical learning: the three domains | 72
4.1 Example of an organizer for exploring the relationship between two variables | 79
4.2 Example of scaffolding for exploration of a linear relationship between two numeric variables | 81
4.3 Indicators of effective assessment | 86
4.4 Sample objectives for an assignment assessing a linear relationship between two quantitative variables | 105
4.5 Example of marking criteria for an assignment assessing a linear relationship between quantitative variables | 106
5.1 Multiple perspectives and potential evidence sources | 118
5.2 Focusing the evaluation | 129
5.3 Focus questions for developing the evaluation framework | 130
5.4 A general comlist for the objectives of this study | 132
5.5 An example of an expansion (of checkpoint 1.1 of Table 5.4) of the general comlist | 134
5.6a An integrated evaluation framework for both case studies for the Observation Phase | 136
5.6b An integrated evaluation framework for both case studies for the Development Phase | 137
5.6c An integrated evaluation framework for both case studies for the Implementation Phase | 138
5.6d An integrated evaluation framework for both case studies for the Review Phase | 139
5.7 Focus detail of the teaching/learning framework | 140
6.1 Implementation cycles of STAT131 included in this study | 144
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.2</td>
<td>Focusing the evaluation of the learning framework for STAT131</td>
<td>158</td>
</tr>
<tr>
<td>6.3</td>
<td>Student survey responses for each implementation</td>
<td>161</td>
</tr>
<tr>
<td>6.4</td>
<td>Student enrolment for the observation phase and each implementation</td>
<td>161</td>
</tr>
<tr>
<td>6.5</td>
<td>Failure rates (%) across all implementations</td>
<td>171</td>
</tr>
<tr>
<td>6.6</td>
<td>Percentages of students reporting that teamwork worked well across all implementations</td>
<td>173</td>
</tr>
<tr>
<td>6.7</td>
<td>Submission rates for assignments across all implementations</td>
<td>173</td>
</tr>
<tr>
<td>6.8</td>
<td>Percentage of students reporting belief in exam preparedness after completing all set tasks across all implementations</td>
<td>187</td>
</tr>
<tr>
<td>6.9</td>
<td>Percentage of students reporting belief in statistical learning across all surveyed sessions</td>
<td>188</td>
</tr>
<tr>
<td>6.10</td>
<td>Percentage of students reporting perception of subject relevance across all surveyed sessions</td>
<td>188</td>
</tr>
<tr>
<td>6.11</td>
<td>Percentage representation of cognitive demand of final exams autumn 2003, autumn 2004 and autumn 2005 (regression question)</td>
<td>192</td>
</tr>
<tr>
<td>7.1</td>
<td>Redefinition of the learning objectives 2005</td>
<td>204</td>
</tr>
<tr>
<td>7.2</td>
<td>Essay Marking Criteria for Accounting Theories and Philosophies</td>
<td>212</td>
</tr>
<tr>
<td>7.3</td>
<td>Aspects of the teaching/learning framework ranked by percentage of students perceiving them as moderately to extremely important to their learning (N=150)</td>
<td>216</td>
</tr>
<tr>
<td>7.4</td>
<td>Percentage of students responding to overall subject learning (N=150)</td>
<td>218</td>
</tr>
<tr>
<td>7.5</td>
<td>Confidence in topic learning ranked by percentage of students</td>
<td>219</td>
</tr>
<tr>
<td>7.6</td>
<td>Perceived competence in objective achievement ranked by percentage of students</td>
<td>221</td>
</tr>
<tr>
<td>7.7</td>
<td>Percentage of students reporting experience of group work (N=150)</td>
<td>222</td>
</tr>
<tr>
<td>7.8</td>
<td>Descriptive statistics for the continuous assessment</td>
<td>223</td>
</tr>
<tr>
<td>7.9</td>
<td>Pearson’s correlation coefficient (r) for student assessment with their final exam marks</td>
<td>224</td>
</tr>
<tr>
<td>7.10</td>
<td>Descriptive statistics for exam questions (N=223)</td>
<td>225</td>
</tr>
<tr>
<td>8.1</td>
<td>Evaluation of aligned teaching</td>
<td>235</td>
</tr>
<tr>
<td>8.2</td>
<td>Evaluation of student learning</td>
<td>237</td>
</tr>
<tr>
<td>8.3</td>
<td>Evaluation of aligned assessment</td>
<td>238</td>
</tr>
<tr>
<td>8.4</td>
<td>Constructive alignment</td>
<td>239</td>
</tr>
<tr>
<td>8.5</td>
<td>Evaluation of statistical learning</td>
<td>240</td>
</tr>
<tr>
<td>8.6</td>
<td>Evaluation of critical and evaluative thinking</td>
<td>241</td>
</tr>
</tbody>
</table>
### Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1</td>
<td>Diagrammatic representation of developmental trends in thinking and conceptions of teaching</td>
<td>18</td>
</tr>
<tr>
<td>2.3</td>
<td>Action research spiral</td>
<td>31</td>
</tr>
<tr>
<td>3.1</td>
<td>Expanding Kolb’s learning cycle to include learning about learning</td>
<td>48</td>
</tr>
<tr>
<td>3.2</td>
<td>Kolb’s learning cycle</td>
<td>51</td>
</tr>
<tr>
<td>3.3</td>
<td>Teaching/learning framework showing relevant learning theory inputs</td>
<td>55</td>
</tr>
<tr>
<td>3.4</td>
<td>Outcomes of statistics education</td>
<td>71</td>
</tr>
<tr>
<td>4.1</td>
<td>Two-Dimensional Sub-classification of <em>Meta-cognitive</em> knowledge</td>
<td>76</td>
</tr>
<tr>
<td>5.1</td>
<td>A logic model for the teaching/learning framework</td>
<td>127</td>
</tr>
<tr>
<td>6.1</td>
<td>Teaching/learning framework showing implemented strategy inputs</td>
<td>151</td>
</tr>
<tr>
<td>6.2</td>
<td>Comparison of reported Assignment 1 marks (scaled out of ten) with recorded assessment data across all implementations</td>
<td>162</td>
</tr>
<tr>
<td>6.3</td>
<td>Ranked order of the reported proportions of students perceiving surveyed facets as important to their learning (2002)</td>
<td>165</td>
</tr>
<tr>
<td>6.4</td>
<td>Distribution of marks for completed laboratory tasks for students achieving greater than 50% in the final exam</td>
<td>170</td>
</tr>
<tr>
<td>6.5</td>
<td>Comparison of mean marks for the three assignments across all implementations</td>
<td>174</td>
</tr>
<tr>
<td>6.6</td>
<td>Comparison of the distribution of assignment marks across all implementations</td>
<td>175</td>
</tr>
<tr>
<td>6.7</td>
<td>Boxplot of final exam marks across all sessions</td>
<td>189</td>
</tr>
<tr>
<td>7.1</td>
<td>Comparison of distributions of reported and actual Presentation marks from the assessment data file</td>
<td>215</td>
</tr>
<tr>
<td>7.2</td>
<td>Possible structure for lecture</td>
<td>228</td>
</tr>
</tbody>
</table>