Computer-based testing with ExamSoft: Preliminary data on student acceptance and impact on exam performance and learning

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Context

- SOD July 2015
- Increasing popularity of CBT in higher education
- Some unanswered questions
  - Student acceptance of the new testing approach
  - Score comparability
  - Impact of CBT on student learning

The modified Technology Acceptance Model (TAM)
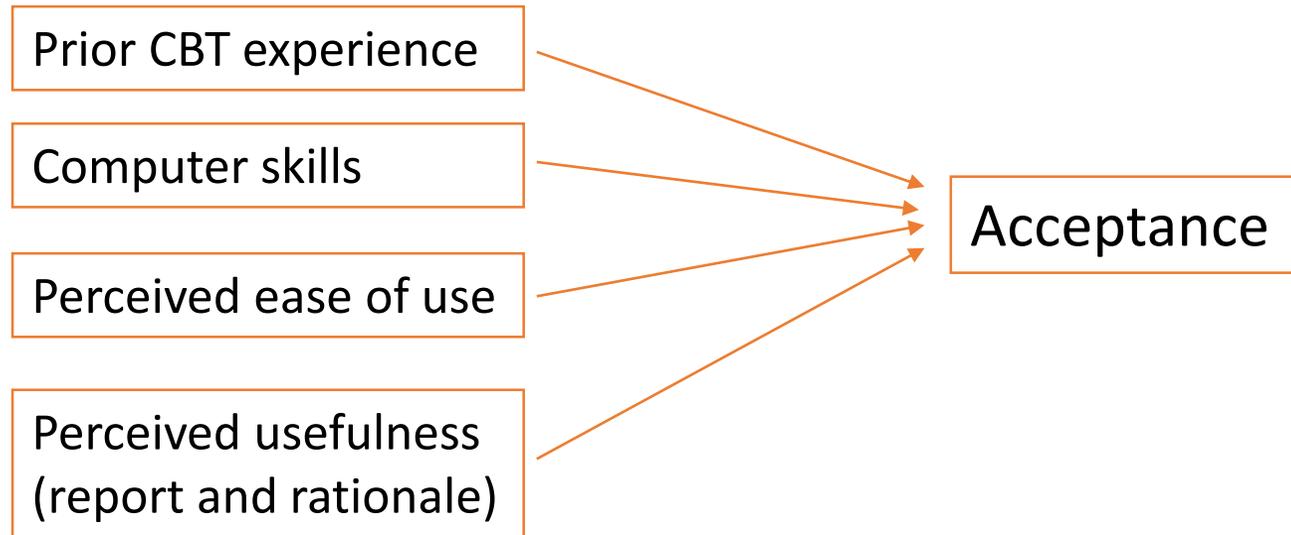
Davis, F. (1989). Perceived Usefulness, Perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319-340.

Davis, F., Bagozzi, R.P., & Warshaw, P.R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Manage Sci, 35* (8), 982-1003.

Research questions

1. How widespread is the acceptance of ExamSoft (ES) by Y1 and Y2 pre-doctoral students at University of the Pacific?

2. What are the factors that impact Pacific students' acceptance of ExamSoft?

3. What is the impact of ExamSoft on Pacific students' exam performance and learning?

Data sources

- Student survey
  - DDS1 (n = 116, 82% response rate), DDS2 (n = 112, 79% response), IDS1 (n = 23, 96% response rate)
- 3 independent guided focus groups with students
- 1 guided focus group with faculty
- Analysis of 'comparable' exam scores
  - Mid term and final exam scores

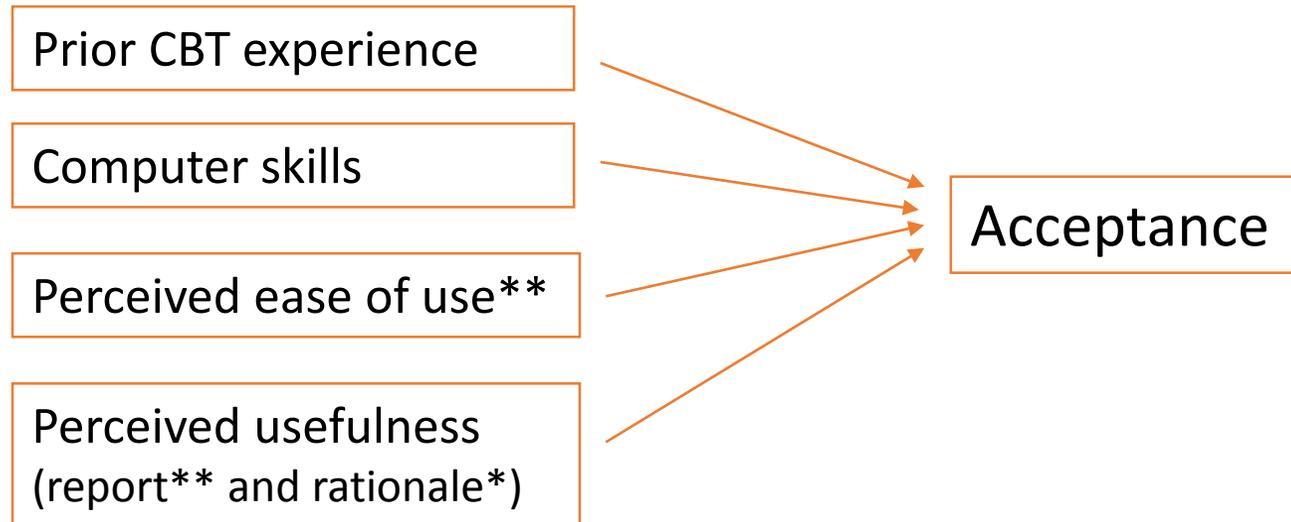# RQ1: Student acceptance

ExamSoft is an effective testing system.

Class	Strongly Disagree	Disagree	Agree	Strongly Agree	Mean
DDS1	1 (0.9%)	20 (17.2%)	89 (76.7%)	6 (5.2%)	2.86
DDS2	6 (5.4%)	13 (11.6%)	80 (71.4%)	13 (11.6%)	2.89
IDS1	1 (4.3%)	3 (13%)	14 (60.9%)	5 (21.7%)	3.00
Total	8 (3.2%)	36 (14.3%)	183 (72.9%)	24 (9.6%)	2.89

RQ1: Student acceptance

I feel comfortable taking exams on ExamSoft.

Class	Strongly Disagree	Disagree	Agree	Strongly Agree	Mean
DDS1	1 (0.9%)	12 (10.3%)	89 (76.7%)	14 (12.1%)	3.00
DDS2	4 (3.6%)	6 (5.4%)	80 (71.4%)	22 (19.6%)	3.07
IDS1	1 (4.3%)	3 (12%)	18 (78.3%)	1 (4.3%)	2.83
Total	6 (2.4%)	21 (8.4%)	187 (74.5%)	37 (14.7%)	3.02

RQ2: Factors impacting student acceptance

- o **b=.61, t(249) = 11.97, p=.00. Perceived ease of use significantly predicted acceptance of ES. It explained 37% of variance in student acceptance, R^2= .37, F(1, 249) = 143.31, p=.00.
- o **b=.24, t(186) = 4.12, p=.00. Perceived usefulness of exam report significantly predicted acceptance of ES. It explained 8% of variance in student acceptance, R^2= .08, F(1, 186) = 16.95, p=.00.
- o *b=.13, t(140) = 2.07, p=.04. Perceived usefulness of rationale significantly predicted acceptance of ES. It explained 3% of variance in student acceptance, R^2= .03, F(1, 140) = 4.30, p=.04.

RQ3: (a) Impact on exam performance

- Results of exam score comparison
  - Mean score on paper exam was significantly higher than on ES exam for 11 exams.
  - Mean score on ES exam was significantly higher than on paper exam for 12 exams.
  - Mean score on paper and ES exams was not significantly different for 10 exams.

RQ3: (b) Impact on learning

I get timely feedback on my exam performance.

Class	Strongly Disagree	Disagree	Agree	Strongly Agree	Mean
DDS1	4 (3.4%)	21 (18.1%)	71 (61.2%)	20 (17.2%)	**2.92****
DDS2	31 (27.7%)	54 (48.2%)	27 (24.1%)	0 (0%)	1.96
IDS1	2 (8.7%)	14 (60.9%)	5 (21.7%)	2 (8.7%)	2.30
Total	37 (14.7%)	89 (35.5%)	103 (41%)	22 (8.8%)	2.39

**$F_{(2, 248)} = 51.51$, p=.00.

DDS1 students were more likely to receive timely feedback on exam performance.

RQ3: (b) Impact on learning

The rationale for answers is helpful for my learning.

Class	Strongly Disagree	Disagree	Agree	Strongly Agree	N/A (Don't get the rationale)
DDS1	2 (1.7%)	13 (11.2%)	45 (38.8%)	23 (19.8%)	33 (28.4%)**
DDS2	2 (1.8%)	3 (2.7%)	21 (18.8%)	23 (20.5%)	63 (56.3%)
IDS1	0 (0%)	1 (4.3%)	7 (30.4%)	2 (8.7%)	13 (56.5%)
Total	4 (1.6%)	17 (6.8%)	73 (29.1%)	48 (19.1%)	109 (43.4%)

**X^2(8, N= 251)=27.22 , p=.00.

DDS1 are significantly **more likely** than **both DDS2 and IDS1** to report that faculty provide written rationale as part of exam feedback.

RQ3: (b) Impact on learning

The Strengths & Opportunities report is helpful for my learning.

Class	Strongly Disagree	Disagree	Agree	Strongly Agree	N/A (Don't get the report)
DDS1	1 (0.9%)	20 (17.2%)	67 (57.8%)	21 (18.1%)	7 (6%)**
DDS2	3 (2.7%)	3 (2.7%)	37 (33%)	23 (20.5%)	46 (41.1%)
IDS1	1 (4.3%)	0 (0%)	7 (30.4%)	5 (21.7%)	10 (43.5%)
Total	5 (2%)	23 (9.2%)	111 (44.2%)	49 (19.5%)	63 (25.1%)

**$X^2(8, N= 251) = 57.64$, p=.00.

DDS1 are significantly **more likely** than **both DDS2 and IDS1** to report that faculty release a Strengths & Opportunities report as part of examination feedback.

RQ3: (b) Impact on learning

- Themes from student focus groups
  - All students perceive ES reports to be helpful for learning.
  - All students perceive timely feedback on exam performance to be helpful for learning.
  - Y1 students review electronic exam reports as soon as they are released and before final exam.
  - Y2 students frequently do not receive timely feedback and often do not review exam material at all.

Preliminary conclusions

- ES is well accepted as a testing tool by Y1 and Y2 dental students at Pacific.

- Perceived ease of use and perceived usefulness are significant predictors of Pacific dental students' acceptance of ES in accordance with the modified TAM model.

- Findings on how ES impacts exam performance of Pacific dental students are unclear.

- Exam reports and timely feedback likely support dental student learning (or the perception thereof).

- Dental students and faculty perceive that ES has advantages as a learning tool in addition to as a testing tool.