

Predicting the use of Blackboard and the use of a Personal Digital Analyser with the Technology Acceptance Model

A comparative and cross-validation research among Dutch pupils aged 12–18

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Marnick and Jeffrey working with a PDA system

1. Introduction

NET-generation: the use of digital tools drops dramatically during school hours (Veen, 2004).

'Kiss my Electronic Learning Environment good bye' (Kirschner, 2004).

The use of separate digital tools like a Personal Digital Analyser (PDA) might well prove much more attractive for pupils.

Cross-validation research: Blackboard sample Dutch pupils – American students
Comparative research Blackboard sample Dutch pupils – PDA sample Dutch pupils

1.1. Research questions and hypotheses

1. Is the Technology Acceptance Model (TAM) a valid model for pupils aged 12–18 for predicting the use of Blackboard and for predicting the use of a PDA?
2. Is the use of a PDA more attractive in education for children aged 12–18 than the use of Blackboard?
3. What factors determine the use of Blackboard or the use of a PDA for pupils aged 12–18?
4. Is there a difference between pupils in lower classes (aged 12–15) and higher classes (aged 16–18)? (Only investigated for the Blackboard sample).
5. Is there a difference between males and females?
6. Is there a difference between American students in higher education and Dutch pupils at a secondary school in the way they respond to Blackboard?

Hypothesis 1: The same internal and external factors as Yi's (2003) research, determine the behavioural intention to use Blackboard and to use a PDA.

Hypothesis 2: The use of a PDA is more attractive for pupils aged 12–18 than the use of Blackboard.

Hypothesis 3: These findings are independent of age and gender.

Hypothesis 4: The cross-validation of the research among American students in higher education aged 18–20 and Dutch pupils aged 12–18 shows the same results.

2. Method

The results of a research with the Technology Acceptance Model (TAM) modified by Yi (2003), serves as a zero measurement instrument. All the questionnaire items used an 11-point Likert-type scale. The questionnaire consists of 23 questions centred around the following items: Learning goal orientation; Application specific self-efficacy; Enjoyment; Ease of use; Usefulness; Behavioural intention

3. Results

3.1. Respondents Blackboard sample and respondents PDA sample

Respondents Blackboard sample: The respondents' age ranges from 12 to 19. Most of the pupils are 14 years old (39%). Average age: 16.5 years; s.d. = 0.9 years. 39% of the respondents are female.

Respondents PDA sample: The respondents' age range from 12 to 15. Most of the pupils are 14 years old (54%). Average age: 13 years; s.d. = 0.7 years. 43% is female.

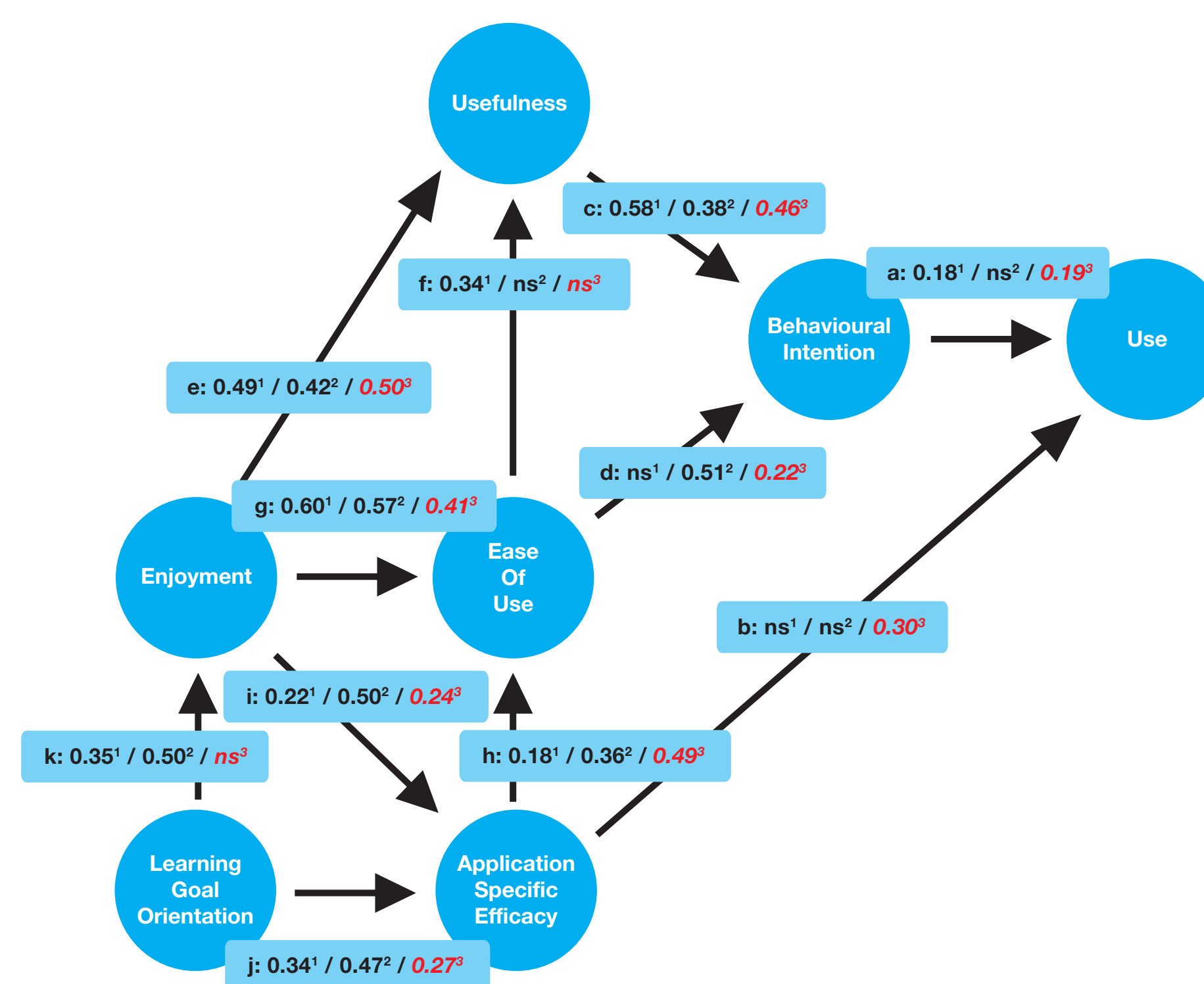
3.3. Comparison of the results of pupils in the Blackboard sample with the results of pupils in the PDA sample

Table 1: The mean score and standard deviation from the Blackboard sample compared with the PDA sample

Construct	Blackboard N=160		PDA N=102		T	Sig (2-tailed)
	Mean	s.d.	Mean	s.d.		
Learning goal orientation	4.47	2.21	7.45	1.53	-11.80	0.000
Application-specific self-efficacy	4.22	2.37	8.00	1.63	-14.00	0.000
Enjoyment	4.36	2.55	8.92	1.58	-16.18	0.000
Ease of use	6.25	1.99	8.11	1.62	-7.80	0.000
Usefulness	4.85	2.15	7.35	1.95	-9.34	0.000
Behavioural intention	3.29	2.27	8.07	1.87	-17.63	0.000

3.4. Regression analyses. Measurement of β -coefficients to test the TAM

Figure 1: Regression analyses to test the proposed model and to compare with the Blackboard sample¹, the PDA sample² and with the β -coefficients of Yi (Yi, et. al., 2003)³.



ns = non significant ¹Blackboard a: p<0.05; h, i: p<0.01; c, e, f, g, j, k: p<0.001.
²PDA e: p<0.01; c, d, g, h, i, j, k: p<0.001. ³The *Italic* β -coefficient are the results out of Yi's research'

Figure 1 provide the results of the regression analysis.

4. Discussion and conclusion

The Technology Acceptance Model (TAM) is a valid model to predict the use of Blackboard and the use of a PDA for Dutch pupils aged 12–18.

The use of a PDA is much more attractive for pupils than the use of Blackboard.

By the arrangement of courses in Blackboard one should pay attention to:

- Goal and achievement orientation
- Usefulness
- Enjoyment

Figure 2. The working triangle. (Galley, 1999).

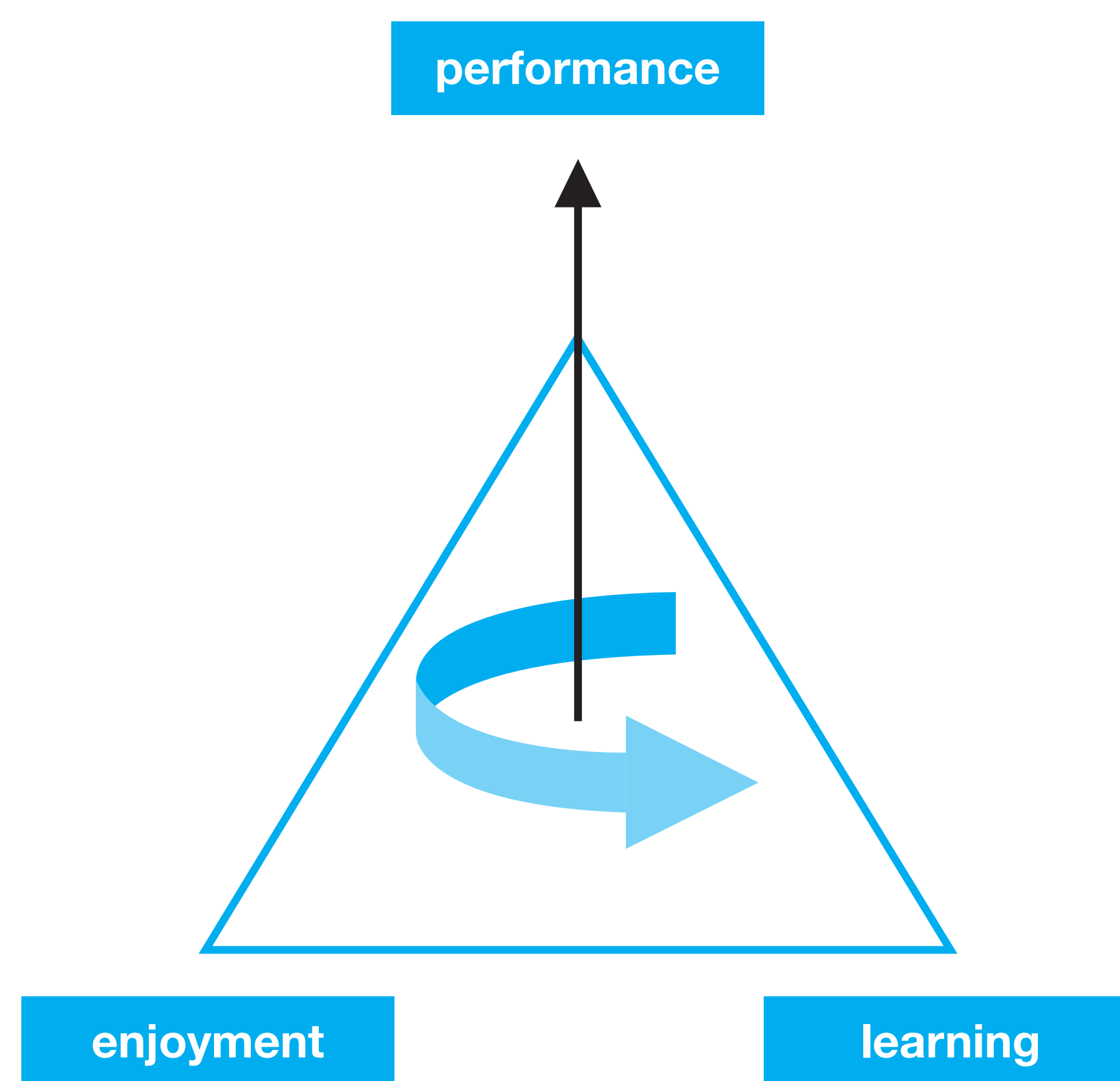


Figure 2 shows that the three sides are part of an interdependent system.

The same internal and external factors as Yi's research' (Yi, et. al., 2003), determine the behavioural intention to use Blackboard and the use of a PDA. The predicting value in both samples and in the American sample shows a strong similarity.

