

Chapter 11

Student Perceptions and Adoption of University Smart Card Systems

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ABSTRACT

This study investigated student adoption of university campus card (UCC) applications. A review of smart card, technology adoption and Unified Theory of Acceptance and Use of Technology (UTAUT) literature led to three focus groups and a survey of student perceptions and attitudes towards the university's campus card. Perceptions of 17 UCC components differed significantly across four student variables – international versus domestic, willingness to load funds, gender, and university level – supporting and extending UTAUT. Willingness to load funds on their UCC differed significantly across 16 out of 17 components, followed by domestic versus overseas students differing on 14 components, university level differing on 13 components and gender on 10. Overall, students reported that extra UCC features would enhance the university's image, improve their student experience, and encourage them to use UCCs. The results and managerial implications can help universities select and prioritise UCC functions for campus adoption and implementation.

INTRODUCTION

Smart cards exemplify an intermediating technology, which requires a critical mass of adopting groups for the technology to succeed (Plouffe, Vandenbosch, & Hulland, 2001). Electronic customer relationship systems, for example, need adoption

by both individuals and organisations (Jones, 2009; Wu & Wu, 2005). In a tertiary environment, successful smart card applications depend on students as individual adopters and organisational adoption by the university and campus merchants such as cafeterias, vending machines and bookshops. Successful implementation of smart cards requires

acceptance by all these parties, particularly the end users. As such, this study focuses on University Campus Card (UCC) adoption at the individual level, by students.

About the size and shape of a credit card, UCCs integrate well into student life on campus (Rochet & Tirole, 2003). A dynamic platform rather than a plastic card, the applications on a UCC may depend on university funding and usually require widespread acceptance by students, merchants and the university. Among other things, these smart cards can incorporate student photos, authenticate memberships or building access, facilitate library borrowing, store homework and pay for purchases such as photocopying, food and drink.

In part due to UCCs' rapidly evolving and growing role in student experiences, there seems little research of smart cards in tertiary education. Yet as UCC technology evolves, universities grapple with issues such as what smart card applications to implement, encouraging student use and successful UCC implementation across myriad departments and organisations. Universities also need to identify and prioritise UCC functions that improve student experiences, university investments and merchant relationships. Business such as bookshops, cafeterias, bank ATM machines and vending machines are woven into the campus tapestry. Finally, universities must gauge external partnerships. Collaborating with public transport, for example, would add a UCC function and reduce the need for a card.

To help address the questions above, this paper draws upon technology adoption literature and an Australian university's UCC challenges. Unlike adoption research that assumes a single adopting group (Plouffe et al., 2001; Wu & Wu, 2005), this paper treats UCCs as an intermediating technology with three adopting groups – merchants, students and the university. The Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh, Morris, Davis, & Davis, 2003) helps frame two qualitative and one quantitative investigation of student UCC adoption.

As individual differences, such as gender, relate to technology acceptance (Sun & Zhang, 2006; Wu & Wu, 2005), this study investigated how four variables – gender, university level, willingness to load fund, and student status – relate to student attitudes towards and use of UCCs.

Besides applying and extending UTAUT to campus cards, the study helps university administrators understand short to medium term implications of UCC systems, including key drivers for increasing UCC use. Understanding these drivers would help universities plan and manage their ongoing UCC investment decisions.

This study starts with a review of smart card technology and its applications in tertiary institutions. Next, technology acceptance literature and the results of two exploratory focus groups lead to a modified UTAUT model and subsequent quantitative survey. After highlighting the quantitative results, the paper concludes with implications, limitations and future research.

LITERATURE REVIEW

Smart Card Review

Compared with traditional magnetic strip cards, smart cards – plastic cards resembling credit cards – have increased storage capacity, security, and application capabilities (Ma et al., 2008; Omar & Djuhari, 2004). Of the two smart card types, memory cards store limited information on a basic chip, usually for a single application such as credit for telephones, vending machines or public transport. Intelligent cards contain microprocessors that can read, write and calculate data (Anderson, 2009; Turban & McElroy, 1998).

Contact-cards contain a metal antenna that must contact a card reader. Contactless cards communicate via a Radio Frequency Identification Device (RFID) and are optimal in areas such as public transport, which have a high volume of rapid transactions (Bain, 1995; Turban & McElroy, 1998).

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