Investigating the factors affecting the Market Acceptance of online tertiary Education in Singapore

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Abstract  
The advent of the Internet/World Wide Web and its application to the field of education has provided new opportunities for teaching and learning. To cater for the large number of potential new students worldwide, many universities and for-profit education providers have introduced online programs. In Singapore, Web-based online education has not attracted as many students as may have been expected. To attempt to explain this situation this study identifies and describes market acceptance factors. Empirical results from an extensive survey showed that there are multiple factors influencing market acceptance of online education in Singapore at the undergraduate and post-graduate level. This influence is comprised of five factors: Courseware design, individual competency, institutional competency, trust and pull factors. Overall, this study contributes to our understanding of student decision-making behaviour for online tertiary education in Singapore.

Keywords: Market acceptance, online tertiary education
Introduction
Online education, which is centred on the use of the Internet and the World Wide Web, presents a new generation of educational tools. Its ‘anywhere any time’ concept, frees the student from the constraints of time and place. Because there are no barriers to information flow over the Internet, it holds promise for a ‘curriculum without walls’ where intellectual richness is available to all. To take advantage of the huge number of potential students worldwide, many universities and commercial education providers moved rapidly to introduce online tertiary programs to get a share of this market. Online programs are now commonplace in many learning institutions.

However, online tertiary education has not attracted as many students as had been expected in Singapore (Gagnon 2002; Tan & Lambe 2002; Wong, Gerber & Toh 2003). There is still a lack of confidence among students, parents and educators in Singapore (Tan & Lambe 2002; Wong et al. 2003) that education online could be an effective medium for imparting knowledge/skills, even though distance education has already taken root in both countries (as shown by the wide popularity of offshore degrees and twining programs). Tan and Lambe (2002) reported that low preference for Web peer-to-peer interaction among online learners presents tough obstacles ahead for any attempts to build online learning communities in Singapore.

Despite extensive studies in online education (mostly centred on improving the quality of online learning outcomes), there is a lack of research in the marketing paradigm. For example, there was a scarcity of discussion on government support, policies, course accreditation and peers or societal influence in relation to market acceptance of online education in Asia. This study addresses these areas and investigates the factors affecting the market acceptance of online tertiary education in Singapore. It contributes to our understanding of student decision-making behaviour for online tertiary education in Singapore.

Market acceptance is defined as the intent to choose or the actual choice of online tertiary education. Tertiary education here refers to both undergraduate and post-graduate studies.
The paradigm shift in university education

Traditionally, university education had been didactic teacher-centred learning in classrooms. In 1999, the Australian Vice Chancellors Committee (AVCC) issued a report that discusses the so-called paradigm shift in university education (summarised in Table 1) that foresees a future period of great change both organisationally and in terms of external links. The report concludes that the outcomes of this paradigm shift will result in a networked society with equal access to knowledge and information, a society of individuals in charge of their learning, and the collaboration of Governments, educators and the private sector in the sphere of education. As prophesised in the AVCC (1999) report, many universities now offer online courses, of either partial or entire degrees.

<table>
<thead>
<tr>
<th>Old paradigm for university education</th>
<th>New paradigm for university education</th>
</tr>
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<tbody>
<tr>
<td>Take what you get</td>
<td>Courses on demand</td>
</tr>
<tr>
<td>Academic calendar</td>
<td>Year-round operations</td>
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<tr>
<td>University as a city</td>
<td>University as an idea</td>
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<tr>
<td>Terminal degree</td>
<td>Life-long learning</td>
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<tr>
<td>University as an ivory tower</td>
<td>University as partner in society</td>
</tr>
<tr>
<td>Student: 18-25 years old</td>
<td>Cradle to grave</td>
</tr>
<tr>
<td>Books as primary medium</td>
<td>Information on demand</td>
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<tr>
<td>Tenure</td>
<td>Market value</td>
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<tr>
<td>Single product</td>
<td>Information reuse/info exhaust</td>
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<td>Student: a three or four year revenue</td>
<td>Life-long revenue resource</td>
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<tr>
<td>source</td>
<td>Competition for domestic &amp; foreign</td>
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<tr>
<td>Competition for foreign students</td>
<td>students</td>
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<td>Student as a ‘pain’</td>
<td>Student as a customer</td>
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<tr>
<td>Delivery in a classroom</td>
<td>Delivery anywhere</td>
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<tr>
<td>Multicultural</td>
<td>Global</td>
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<tr>
<td>Bricks and mortar</td>
<td>Bits and bytes</td>
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<tr>
<td>Single discipline</td>
<td>Multi-discipline</td>
</tr>
</tbody>
</table>

Table 1: Table showing the paradigm shift from old to new of university education

Source: AVCC (1999)

Classes of variables influencing consumer behaviour

Three general classes of variables are involved in understanding consumer behaviour: stimulus, response, and intervening variables (Lawson et al. 1996). Stimulus variables generate the sensory inputs to consumers, while response variables are the resulting mental or
physical reactions of individuals (for example, the act of purchasing a product or forming attitudes about a product/service) who are influenced by the stimulus variables.

Intervening variables act to influence the effect of stimulus variables on consumers response. Intervening variables are intrinsic and include values, mood, knowledge, perception, attitudes, motivation, learning, and unconscious variables such as intelligence, memory process and genetics (Bednall & Kanuk 1999; Goulding 2006; Lawson et al. 1996).

Stimulus variables can be extrinsic or intrinsic, for example stimulation of consumption may arise as a result of (Goulding 2006):

i) Biological needs (the need to eat to satisfy our hunger).
ii) Utility needs (the need to purchase a washing machine to help our daily chores, the need for a car for daily travel to the workplace etc).
iii) Aspirational needs (the desire to acquire a degree to secure a better paid job etc.).
iv) Personal “wants” (induced by past experience, by exposure to information/media advertising).
v) Fiction: fantasy (romance).
vi) Personal motives (acquiring new skills or knowledge etc.).
vii) Hedonism (pleasure seeking)

Socio-cultural environments and marketing activities (especially brand influence) also affect consumption (Bednall & Kanuk 1999; Saren 2006) as do new products/services to markets. Technological developments can take the world by storm (like the Sony Walkman) while others failed or lie dormant and then grow explosively on rediscovery (like the fax machine).

Often, most new products/services achieve slow market penetration at first, and then their adoption grows more quickly, but later slows again (S-curve pattern). One theory which discusses how, why and the rate of which new technology spreads through culture is the Diffusion of Innovation (DoI) theory.

**Diffusion of Innovation**

According to the Diffusion of Innovation [DoI] theory (Roger 1964), technological innovation is communicated through particular channels, among members of a social system over time, working through the following five stages:
i) Knowledge (awareness): Exposure to the existence and understanding of the functions of the innovation.

ii) Persuasion (the forming of a favourable attitude to the innovation): Here the individual is interested in the innovation and actively seeks information/detail about the innovation.

iii) Decision (commitment to the adoption of the innovation): In this stage the individual takes the concept of the innovation and weighs the advantages/disadvantages of using the innovation and then decides whether to adopt or reject the innovation (optional innovation-decision). Alternatively, innovation decisions may be collective (where a decision is reached by consensus among the members of a system), or authority-based (where a decision is imposed by another person or organisation which possesses requisite power, status or technical expertise).

iv) Implementation (putting it to use): During this stage, the individual determines the usefulness of the innovation and may search for further information about it.

v) Confirmation (reinforcement based on positive outcomes from the innovation): In this stage the individual finalizes their decision to continue using the innovation and may use the innovation to its fullest potential.

This study adapts and focuses on the “decision stage” of the Diffusion of Innovation theory, investigating factors influencing the market acceptance (intent or actual adoption) of online tertiary education in Singapore.

**Pull factors of online tertiary education**

Within the education marketing literature, the concept of pull factors had been originally used by Mazzarol and Soutar’s (2002) ‘push-pull’ theory of factors influencing international student destination choice to indicate the factors that operate within the host country that make it attractive to international students. These pull factors ranged from awareness and knowledge of the host country, family and peer’s recommendation, costs, host country environmental factors including racial discrimination and geographic proximity to social links. Pull factors in this study refer to the characteristics of online tertiary education that provide utility or are relatively attractive to potential students to meet their personal motives.

*Convenience of learning and teaching*

Holmberg (1989), Rowntree (1995) and Poole (1999) cited the following main reasons why a student undertakes distance tertiary education: encouragement from their employer to
upgrade their skills without interfering with their workload or work commitment (difficult to take time off from their job to study); family commitment and geographical constraints (distance from learning institutions). The “anywhere any time’ and ‘curriculum without walls’ concepts of Internet-based education means that there are no spatial or time constraints (24:7 access) for study/learning, appealing to potential students who otherwise have work or family commitments.

For academics, the Internet (more specifically the Web) has significant advantages over other media in delivering distance education. It is effective for delivering virtual courses because of its global appeal, global access, easier updating of content, and information richness (Wulf 1996). Online education (Internet-based or campus network-based) presents a convenient delivery system for teaching (Chipman 2001; Dunning & Vijayaraman 2001). Common reasons cited for taking online courses in the Dunning and Vijayaraman’s report are class schedule flexibility, reduced commuting and convenient times.

**Learning styles and online education**

The work of DiBartola, Miller and Turley (2001) compares the learning outcome of students using Kolb’ (1984) “Learning Style Inventory” (with the indicators being converger, diverger, assimilator & accommodator) in a traditional classroom with those taking the same course online. While concluding that individual learning styles did not appear to affect learning outcome in either group, DiBartola et al. (2001) reports that the divergent learning style have above-average scores learning online. According to Kolb (1984), divergers have strong imaginative ability, and are good at generating ideas and seeing things from multiple perspectives (concrete experience and reflective observation) and so respond well to online learning.

The effect of learning styles on learning outcomes in an online environment has also been research by Waterman (2000). Waterman reports online education largely disadvantages students who have auditory (learns things from listening) and kinesthetic styles (learns things from doing) because it favors visual learners.

**Interactive and group learning**

Kearsley (2000) reported superior results in the virtual classroom for students who took advantage of the interactive opportunities provided by an online facilitator who actively
interacted with their students via emails. Chin, Bauer and Chang (2000) reported Asian students have significantly more trouble dealing with tasks related to online education and recorded less access to Web-based materials than Anglo-Saxon students. While concluding that online education was popular amongst students regardless of cultural background, Chin et al. (2000) reported that Asian students generally found communicating online less threatening and were more willing to participate in group activities using this medium than compared to classroom study.

Lower course entry requirement
Other advantages or attractive features of online education are that course entry requirements are often less stringent for study than a physical campus as most online programs are created for mature students with work experience (Philips 2007).

From the above, this study proposed:

>Hypothesis 1: ‘Pull factors’ have a positive influence on market acceptance of online education in Singapore.

Individual competency factors
This refers to the skills or inadequate knowledge (intervening variables) that impedes an individual from studying online or adopting online tertiary education.

Self-motivation for independent learning
Effective utilisation of the Web for education purposes, means learners must be able to initiate active peer-to-peer discussion (Ruberg, Moore & Taylor 1996); deal with feelings of isolation and singularity (Dringus 1999); have awareness of content and audience (Dringus & Terrell 1998); and be able to evaluate their own learning process (Land & Hannafin 1996). Learners who procrastinate and have low self-motivation for independent learning may not be suitable for online education (Naidu 1994; Berge & Huang 2004). Similarly, Warner, Christies and Sarojini (1998) reported 70% of Australian vocational education and training learners lack the disposition and skill readiness for self-directed learning, the basis of online education.

Writing and computing skills
Ragan and White (2001) observed the unusual demand for written communication in term of speed, volume and clarity in a Web environment, presents a great potential for miscommunication and could make students unnecessarily frustrated, leading to low student retention in the Web-Based Learning (WBL) environment. Further, Alexander (1999) asserted that computing skills affect students’ satisfaction with online learning, potentially impeding its popularity. Consequently, this study proposed:

Hypothesis 2: ‘Individual competency factors’ have a positive influence on market acceptance of online education in Singapore.

Courseware design factors
This refers to the design of the Web-based program that facilitates student-learning outcomes (i.e. acquiring new knowledge, skills, & experience).

Program structure
Easy and immediate access by learners to the right content at the right time (up-to-date information) could motivate people to learn and apply their knowledge and skills to improve their individual and organisational performance (Levesque and Kelly 2002). To improve learning site user acceptance, Levesque and Kelly recommended a user-friendly (structured) format that facilitates easy navigation through the content; book (screen) marking that allows the student to return to the last page studied; and interactivity amongst online learners. Horton (2000) observed that course material for Web-Based Training has to be more complete, accurate and precise because the instructor is not present to correct minor mistakes and clear up misunderstandings. Horton asserted that good structure and clarity of design of online course programmes are imperative for any successful implementation of Web-based learning.

Technical support or helpdesk
The availability of technical support or “helpdesk” facilitates student satisfaction amongst online learners (Leiblein 2000). Leiblein wrote an online student is time sensitive to a teacher’s response to query or feedback and that the online learning facilitators must ensure prompt feedback to student enquiries for effective learning outcomes (i.e. new knowledge or skills). Similarly, Mason and Weller (2000) and Levesque and Kelly (2002) recommended timely and regular feedback to ensure positive student learning experience in the online mode.
Visualisation technologies
Levesque and Kelly (2002) recommended the application of visualisation technologies to make learning online more effective “because a picture is worth a thousand words”. One such example is changing data into attractive moving graphics accompanied by sound rather than tables of numbers.

Self-checking activity
Lockwood (1993) observed that self-checking activity incorporated into Web-based program could improve student learning online. Lockwood asserted self-checking activity could help kinesthetic learners who learn by doing or from experience and students who like self-directed learning.

From the above, this study proposed: Hypothesis 3: ‘Courseware design factors’ have a positive influence on market acceptance of online education in Singapore.

Institutional competency factors
Government support in the form of accreditation and recognition of online degrees
There is a need for government recognition of online degrees to ensure credibility and quality of online degrees (Alhabshi 2002). Accreditation of online course or degrees by the relevant home government of the course provider or professional bodies can reduce the problem of the ‘certificate mill’ (Philips 2007). A certificate mill refers to the provision of worthless education degrees for a fee without active study participation.

Industry collaboration
Mitchell (2000) points out the lack of business models and business rational underpinning online education, is also impeding its uptake as an alternative medium to the traditional classroom. Successful online tertiary education providers such as Phoenix University, largely support employer-paid technology courses, (which reduce face-to-face training saving travel and time-off costs), implying industry collaborative courses are the key to successful adoption by the general public (Ryan 2001).

Hypothesis 4: ‘Institutional competency factors’ have a positive influence on the market acceptance of online education in Singapore.
Trust factor

The concept ‘trust’ has aroused intense interest across different disciplines, resulting in various definitions in the literature. Despite this, there is a common practice of defining trust in terms of ‘having confidence’, or ‘willingness to rely on the other party’ or ‘willingness to take risk’ in existing literature (Deutsch 1962; Gefen et al. 2003; Mayer et al. 1995; Rousseau et al. 1998). According to Selnes (1998), trust is important in facilitating “relationship enhancement” in buyer-seller interactions and for reducing perceived risk using services. Since online learners have no direct contact (virtual buyer-seller relationship) with the education providers, trust plays an important role in online tertiary education settings.

From a student’s perspective, “perceived risk” using online tertiary education can be:
1) Functional risk- The risk that the program will not meet student expectations (poor quality or the program being unable to help students upgrade their skills).
2) Financial risk- The program is not worth the investment or loss of investment when the program is not relevant to student needs. For example, will an online MBA degree help a person get a better job in their home country?
3) Social risk- A poor choice of program may result in social embarrassment (reference group members and significant others may not support the choice). For example, inability to finish a program as expected or enrolling in a university that has a reputation of certificate fraud.
4) Psychological risk- The risk that a poor choice of program will damage the consumer’s ego or the service may not meet his/her needs.
5) Time risk- Time spent studying for a degree will be wasted if industry or government does not recognize the online degree in the student’s home country.

Regular faculty evaluation

In the eyes of potential and current online tertiary students regular faculty evaluation may ensure the continuing quality of online courses (Philip 2007). Baumgardner (2000) asserted the need for faculty evaluation when assessing the quality debate of online education to ensure its quality.

Customer-centric programmes
One way of reducing “perceived risk” adopting (purchase) online tertiary education is making online course offerings customer-centric. The program should help students to upgrade their skills for career advancement and be relevant for industry needs (Wong et al. 2003).

Security
Security, which was once considered to be just a consideration for government computer systems, is now one of the major issues for all IT administrators and computer users (Fisch & White 2000). Fisch and White point out that a good security system provides confidentiality and integrity by confirming the identity of the people who are attempting to access the computer or network, and protects against inappropriate access by others. This paper argues that student identity verification to prevent exam fraud or information theft (and to strictly ensure confidentiality of student’s personal biodata) should be the basis of trust building in Web-based education (network) systems.

Consequently, this study proposed:

*Hypothesis 5: ‘Trust factors’ have a positive influence on market acceptance of online education in Singapore.*

A conceptual model summarizing the above hypotheses is shown in Figure 1.
Figure 1: Hypothesized model of factors influencing market acceptance of online education in Singapore at both undergraduate and postgraduate levels

Methodology

This study used a two-stage research design. First, an exploratory approach where semi-structured in-depth interviews with twelve education experts was undertaken with the aim of confirming that the variables identified in the literature review were valid in the Singapore context; and to identify any other variables specific to the Singapore environment not identified in the literature. This exploratory study produced conclusive evidence that all findings identified in the literature search (as presented in Figure 1) were important influencing factors on market acceptance of online education in Singapore.

Additional findings from the exploratory study:

(i) Availability of funding from private sources (such as Singapore’s Central Provident Fund) for students undertaking online degrees, enhance the “pull” of online tertiary education. Further, the availability of online tutors who are skilled learning motivators, are also important.

(ii) Access and download times influences user’s satisfaction for learning online. Heavy graphics and banners incorporated into Web-based learning program (courseware design factor) that slow down download time, annoyed all interviewees.

(iii) Mixed-mode delivery of teaching/learning would enhance “trust” in online tertiary education. Other “trust” enhancing factors include greater public awareness of online degrees and the reputation of the online tertiary provider.

The second stage was survey based. The additional findings from the interviews were incorporated into the relevant constructs shown in the conceptual model (Figure 1), which then guided the development of this questionnaire. The questionnaire was pre-tested on 20 Singapore students from the University of Otago, New Zealand to test its face validity. The questionnaire took between 10-15 minutes for the respondents to complete. No problems were found in question comprehension when the respondents were asked for their opinion about the difficulty of completing the questionnaire.

The final questionnaire contained the following sections:

• Section one contained questions on respondent demographics (intended education level, gender).
• Section two asked respondents to rate the importance of factors affecting the market acceptance of online education in Singapore on a seven-point numerical rating scale ranging from ‘not at all important’ (1) to ‘very important’ (7).

Sample
Targeted samples were high school and junior college students in Singapore. The self-completion questionnaires were randomly distributed via mall-intercepts. Students in their school uniforms are a common sight in the various shopping malls in Singapore, are easy to identify and solicit responses for the survey. To ensure that all possible times were represented when students went to malls, preliminary observations were taken to identify the times the malls have the largest concentration of students. Afternoons from 1-6pm were observed to have the greatest concentration of students in all the randomly selected malls. The main author positioned himself at high traffic locations near mall entrances to select respondents to survey.

Overall, 667 questionnaires were distributed with 463 questionnaires returned (response rate=69.4%). From those questionnaires returned, 26 were rejected due to missing responses or interviewees expressing non-interest in continuing their studies, leaving 437 questionnaires for further analysis. The survey sample comprised 53% males and 47% females. Around half (47%) of the respondents indicated their intention to study for an undergraduate degree while 36% indicated interest in going on to post-graduate study. A fair percentage (16.5%) was interested in diploma study only.

Factorial and structural tests
The 437 completed questionnaires exceeded the primary requirements for factor analysis (being 5:1 case/variable ratio). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett’s test of sphericity were used to test the factorability of the data set. Tabachnick and Fidell (1996) recommended a correlation coefficient of 0.3, a KMO index of >0.6 and Bartlett’s p<0.05 as appropriate for factor analysis. Principal Component Analysis (varimax) using SPSS (ed.14) on each factor scale extracted one clear component. All five factorial scales had a KMO index greater than 0.6 and Bartlett’s p<0.05 indicating their appropriateness factor analysis. Factor loadings ranged from 0.58 to 0.79 for the ‘pull factor’, from 0.76 to 0.84 for the ‘courseware design factor’, and from 0.77 to 0.86 for the ‘individual
competency factor’. The ‘trust factor’ had loadings from 0.64 to 0.79 while the ‘institutional competency factor’ had loadings from 0.88 to 0.91 (Table 2).

To assess the reliability of the measures, the construct’s Composite Reliability (CR) should exceed 0.7 and the Average Variance Extracted (AVE) should exceed 0.5 for convergent validity (Johnson, Herrmann & Huber 2006). The AVE is the amount of variance captured by the construct. All reliability measurements (AVE & CR) surpassed the minimum requirement indicating the measures are reliable and there is adequate convergent validity (Table 2). Because of space constraints, inter-correlation matrices among the five constructs are not reported here but it was noted all AVE values were larger than their highest squared correlations with other constructs, thus providing support for good discriminant validity.

<table>
<thead>
<tr>
<th>Construct (factor)</th>
<th>CR</th>
<th>AVE</th>
<th>Item</th>
<th>Loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual competency</td>
<td>0.77</td>
<td>0.71</td>
<td>Self-motivation for independent learning</td>
<td>0.77</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Writing &amp; communication skills</td>
<td>0.84</td>
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<td></td>
<td></td>
<td></td>
<td>Computer skills</td>
<td>0.86</td>
</tr>
<tr>
<td>Trust</td>
<td>0.79</td>
<td>0.60</td>
<td>Security (prevention of exam fraud)</td>
<td>0.64</td>
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<td></td>
<td></td>
<td></td>
<td>Public awareness</td>
<td>0.64</td>
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<td></td>
<td></td>
<td></td>
<td>Reputation of university (online provider)</td>
<td>0.69</td>
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<td></td>
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<td></td>
<td>Use of mixed mode instruction</td>
<td>0.71</td>
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<td></td>
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<td></td>
<td>Relevant course program (career)</td>
<td>0.75</td>
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<td></td>
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<td></td>
<td>Regular faculty evaluation</td>
<td>0.79</td>
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<tr>
<td>Pull</td>
<td>0.82</td>
<td>0.54</td>
<td>Convenience-based delivery</td>
<td>0.58</td>
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<td></td>
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<td>Lower entry requirements for working adult</td>
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<td></td>
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<td></td>
<td>Suit different learning style</td>
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<td></td>
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<td></td>
<td>Availability of funding from CPF</td>
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<td></td>
<td></td>
<td></td>
<td>Interactivity and peer collaboration</td>
<td>0.69</td>
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<td></td>
<td></td>
<td></td>
<td>Online tutor as motivator</td>
<td>0.77</td>
</tr>
<tr>
<td>Institutional competency</td>
<td>0.87</td>
<td>0.85</td>
<td>Government recognition of online degree</td>
<td>0.88</td>
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<td></td>
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<td></td>
<td>Industry collaboration/support</td>
<td>0.89</td>
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<td></td>
<td></td>
<td></td>
<td>Course accreditation with regulative body</td>
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<tr>
<td>Courseware design</td>
<td>0.89</td>
<td>0.72</td>
<td>Fast download time/delivery</td>
<td>0.76</td>
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<tr>
<td></td>
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<td>Good structure and clarity of design</td>
<td>0.77</td>
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<td></td>
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<td>Visualization technology</td>
<td>0.79</td>
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<td></td>
<td>Provision of self-checking activity</td>
<td>0.81</td>
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<td></td>
<td></td>
<td></td>
<td>Good technical support/helpdesk</td>
<td>0.84</td>
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</table>

Table 2: Factor analysis component scores from the five factor scales (constructs) used in the proposed hypothetical model and their CR and AVE values
Structural model testing using AMOS (version 4.0) on the 5-factor model revealed sufficient goodness-of-fit statistics for hypotheses testing (CMIN/DF=2.67, RMSEA=0.05, GFI=0.90, CFI=0.92). The structural test statistics of the proposed hypothetical model are presented in Figure 2.

Figure 2: Structural test statistics of the proposed hypothetical factors influencing the market acceptance of online tertiary education in Singapore
Findings and implications

Online tertiary education “Pull” Factors

This study supported Hypothesis 1: ‘Pull factors’ have a positive influence in the market acceptance of online education in Singapore (regression wt=0.65 figure 2), albeit the least important among the five hypothesized factors. The ‘Pull factors’ were measured by six observed variables namely: The importance of convenience-based delivery (no fixed class schedule to meet), availability of education funding from Singapore Central Provident Fund (CPF), lower entry requirements for working adults, online tutor as motivator, suiting different learning styles and community building (interactivity & peer collaboration). The issue of community building within the Web-Based Learning environment is being reported extensively in the literature. In particular, Tan and Lambe (2002) revealed that peer interactions are not high on the priorities of online learners. This study duplicated this finding.

Online tertiary education providers are advised to collectively lobby the Singapore Government to allow students to use CPF funds for private studies. The CPF is a comprehensive social security savings plan, which provides Singaporeans with retirement income. Working Singaporeans and their employers make monthly contributions to the CPF. Currently, withdrawals are only allowed for local university and polytechnic studies. Similarly, online tertiary providers can introduce bridging course modules for those not meeting the entry requirements for a particular course program.

While acknowledging that those interested in online tertiary education are mostly time-or distance disadvantaged, an initial on-campus orientation is recommended for community building (networking). Face-to face meeting with online tutors and fellow online learners would provide extra advantages of psychological assurance of ‘belonging’ or contribute to a reduction of uncertainty in a virtual environment.

Individual competency factors

This construct had a regression weight of 0.77 (Figure 2), supporting Hypothesis 2: Individual competency factors have a positive influence on market acceptance of online education in Singapore. Potential students’ writing and communication skills, computer skills and student’s self-motivation for independent learning were used to measure this construct.
Regular tutor contact (via e-mail, telephone) with online learners is recommended to support the student’s motivation to continue studies. Tutors who are aware and sympathetic to online learners problems/concerns (example: time-pressed, difficulties with internet technology) would encourage staying the course.

**Courseware design factors**

This study supported Hypothesis 3: *Courseware design factors have a positive influence on market acceptability of online tertiary education in Singapore* (regression wt=0.77 (Figure 2). This construct was measured by the importance of human-computer interaction factors of good structure and clarity of design, good technical support/helpdesk including prompt response times, provision of self-checking activities in online courses, application of visualization technologies and having fast access or download time for the students.

Online tertiary education providers are advised to hire motivated online tutors who are well-versed in computer-based training or online learning program (e.g. Blackboard software). Similarly, online instructional programme designers should not introduce intrusive banners or large clip media (pictures, audio/videos clips) in the courseware that slow down the user’s screen loading.

**Institutional competency factors**

This factor was measured by the importance of industry collaboration/support for online education, course accreditation with appropriate regulatory bodies and government recognition of online degree criteria. The results support Hypothesis 4: *Institutional competency factors have a positive influence on market acceptance of online education in Singapore* (regression wt=0.76, Figure 2). While Tan and Lambe (2002) suggested accreditation as the least important, least ideal feature (from a learner’s perspective) of online learning in Singapore, this study found it a highly rated feature for online university education (mean=6.3 rating out of 7).

Online tertiary education providers should consider accrediting their program with foreign regulatory bodies or seek their own government’s recognition of their online degree. This is in keeping with the Singaporean Government recognising foreign degrees that are supported by their respective governments. Online tertiary education providers should also focus on
customer centric solutions (skills required for specific industries) by collaborating with industry to enhance their graduate’s career prospects. A list of their online graduates in prominent institutions (for marketing promotion) and strong alumni network would greatly enhance the teaching institution’s reputation.

**Trust factor**

Hypothesis 5: *Trust has a positive influence on market acceptance of online education in Singapore* (regression=0.70, Figure 2). The importance of trust was measured by the reputation of the university/institution that offers the course, degree of mixed mode instruction (online with classroom-based teaching), regular faculty evaluation (staff evaluation), public awareness, security (utilization of technology to prevent exam fraud, protect exam records) and relevant course programs for career advancement.

The preference for mixed-mode instruction was emphasised quite strongly in this study (mean 6 on scale 1-7). A regular classroom session in the form of block teaching to complement online teaching is suggested. The venue could be on-campus, schools, hotels or community halls that are central to groups of students. Investing in appropriate security measures by online tertiary education providers to prevent examination fraud and record access should be considered. Online tertiary education providers are also advised to avoid being perceived as providing education degrees for a fee. Better control of their course entry requirements, stricter rules on online attendance and coursework completion would reduce this fear. Additionally, programs should meet the relevant skills required by the industry. This is to ensure that online graduates are able to enhance their personal skills for career advancement. Overall, trust significantly affects the reputation of the online tertiary education providers and public opinion of the degree quality.

**Limitations and directions for future research**

There are several imitations with this study. The mall-intercept sampling used is more of a convenience than a probability sample (Zikmund 2000) although the large sample size (n=437) improves its external validity. While this study tried to increase the randomness of the sample overall by randomly selecting the malls and times to intercept the survey respondents, a comparison of the sample demographic variables with a validation sample (collected in the same geographical areas) would be advisable. This is to ensure
generalizability of the results to the resident population and to test the comparability and stability of the proposed hypothetical models. However, a validation sample was not available for this study.

The effect of an institution’s microenvironment (brand identity, corporate mission and university-alumni relations) on the market acceptance of online tertiary education in Singapore is unknown, as the research did no focus on specific institutions.

Finally, this study should be duplicated in countries with similar socio-cultural environments as Singapore (i.e. Chinese dominated societies) to assess the potential impact of culture (social norms and collectivist nature of Chinese society as articulated by Hofstede 2000) on the market acceptance of online tertiary education.

**Conclusion**

Online tertiary education has not attracted as many students as had been expected in Singapore. To attempt to explain this situation, this study identifies and describes online market acceptance factors. Information gathered from twelve exploratory in-depth interviews and 437 surveys in Singapore revealed factors influencing the market acceptability of online education in Singapore could be grouped into:

i) ‘Trust factors’ as reflected by relevant course program for career advancement, regular faculty evaluation, public awareness, use of mixed mode instruction, security measures to prevent examination fraud and reputation of online tertiary education provider.

ii) ‘Individual competency factors’ as reflected by one’s computing skills, writing and communication skills and self-motivation for independent learning.

iii) ‘Courseware design factors’: Good structure and clarity of design, availability of technical support/helpdesk, provision of self-checking activity and the use of visualization technology (graphics/images/charts).


v) ‘Pull factors’: Convenience-based delivery system (anywhere, any time), suit different learning style, tendencies to have lower entry requirements for working adult, interactivity and peer collaboration and the availability of funds from the Singapore Central Provident Fund (CPF).
Specially, the issue of security, accreditation of online degree, financial support for online tertiary students and industry collaborations or support must be addressed for online education to be widely accepted. Tertiary education providers should centre their marketing strategies on these factors to gain greater acceptance of online tertiary education in Singapore.

References


