Determinants influencing intention to enrol on an online MBA programme

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Abstract: This study aims to investigate the key determinants that influence the students' intention to enrol on an online MBA programme and examine the moderating effect of demographic variables, namely age and gender, to the relationship model. 180 questionnaires were distributed to the adult who has obtained at least a Bachelor's degree and the response rate of 67% was obtained. The analysis was carried out to look at which group is significantly influencing the intention via the multiple regression analysis and tests if the influence moderated by the demographic variables using the hierarchical regression analysis. The findings revealed that three key groups of determinants: individual, technology and the risks perceived, were affecting the students' intention to enrol an online MBA programme. Further analysis shows that intrinsic motivation, computer self-efficacy, acceptance technology and social risk are the four most essential individual determinants of students' intention. It was also found that the influence of perceived risks towards the intention would be stronger among the higher age group. Accordingly, the study provides the policymakers in the field of higher education insight into what is taking place in the domain of virtual campuses and means to set up a sustainable initiatives and strategies for a successful online education.

Keywords: determinants; intention; online MBA programme; Malaysia.

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1   Introduction

The educational needs are becoming continuous throughout one's working life as labour markets demand knowledge and skills that require regular updating (O'Neill et al., 2004). It is, therefore, being observed that the demands on tertiary educational needs are increasing rapidly on the heels of the recent economic crisis, especially from non-traditional students, i.e., working adults' learners. According to Tang et al. (2009), the use of information technology (IT) and the internet are the new paradigm of learning in 21st century. Technological advancements allow people to easily access, gather, analyse and transfer data and knowledge (Tang et al., 2009). E-learning opens up a new platform for many adults who have been tied up with many commitments in life and enable them to learn anytime and anywhere they want at their convenience, without geographical or physical constraints (Goi and Ng, 2009). Accordingly, online learning is an excellent method of catering the adult learners' needs.

According to Sulčič (2010), the pioneers in introducing ICT in learning and teaching processes were institutions that performed distance education and ICT was first used as a distribution channel through which study materials were distributed to the students. The development of internet has made it possible for higher institutions to offer online courses (Tang et al., 2009). Wahlstrom et al. (2003) defined distance learning as any type of instruction in which the student and instructor are separated by physical distance. Ally (2002) described that terms commonly used for online learning include e-learning, internet learning, distributed learning, networked learning, tele-learning, virtual learning, computer-assisted learning, web-based learning and distance learning. He defines online learning as the use of the internet to access learning materials; to interact with the content, instructor and other learners; and to obtain support during the learning process, in order to acquire knowledge, to construct personal meaning and to grow from the learning experience. Carliner (1999) defines online learning as educational material that is presented on a computer while Khan (1997) defines online instruction as an innovative approach for delivering instruction to a remote audience, using the web as the medium. As a result, there is no common definition for online learning.

The knowledge gained during formal education becomes quickly out-of-date and, therefore, needs to be updated (Sulčič, 2010). Different e-learning courses have become useful and popular as leaving a job and enrolling in the formal education as a regular full-time student is not often possible and realisable due to various obligations and responsibilities (Sulčič, 2010). According to Mohamed and Hassan (2008), online learning provides the flexibility to those who have competing responsibilities and priorities of work, family and school and, hence, they are able to obtain degrees without setting their foot in a college campus, avoid travelling long distances leaving work and family and avoid paying any additional costs that they might have incurred through on-campus enrolment. Therefore, online education students can achieve flexibility, convenience, and cost savings (Furst-Bowe and Dittmann, 2001; Anderson et al., 2002). The popularity of web-based learning is derived from its unlimited, 'anytime-anywhere' learning opportunities (Khan, 1997; Moore and Kearsley, 1996; Picciano, 2001). Furthermore, the web-based learning environments promise many advantages allowing more interactive, personalised and independent learning (Brusilovsky, 1999; Chen et al., 2000; Khan, 1997; Park and Lee, 2003). Ultimately, the popularity and the advantages of e-learning have led to the significant growth and development of the online courses and web-based training in higher education institutions.

Allen and Seaman's (2003) report indicated that online was growing rapidly and was perceived positively by faculty and administrators in the USA. According to a survey conducted by Allen and Seaman (2006), enrolments in online courses in the state have increased to about 2.4 million in 2003 and the growth has been continuous and has often exceeded the expectations of organisational planners. Many universities and educationally-based industries have set up portals to offer an e-learning environment either as teaching aids to support conventional teaching approach or as a teaching medium for long-distance or off-campus programmes (Khalid et al., 2006). Similarly, in Malaysia, online learning has started and is gaining popularity in many universities in recent years, for example, most of the universities in Malaysia use online learning to supplement regular campus instruction (Ibrahim et al., 2002). Apart from two established distance learning universities, namely Universiti Sains Malaysia (USM) and Open University Malaysia (OUM), Universiti Tun Abdul Razak (UNITAR), Wawasan Open University (WOU) and other private higher education institutions in Malaysia are not lacking behind in seeking similar opportunities and have introduced several online and distance education programmes to the adult learners.

Currently, online education programmes operate in an extremely competitive environment in their attempt to attract adult students and to increase enrolment (Furst-Bowe and Dittmann, 2001). Phillips and Peters (1999) believed that it has become necessary for universities to adapt their programmes and course offerings to become more in touch with the needs of this changing student market. Accordingly, it is important and essential for the universities or any higher education institutions offering online education programmes to recognise the online students' needs, wants and know about how the students perceive their online education programmes. This paper will explore what are the determinants that will influence the students' intention to enrol an online graduate programme, particularly focus on an online Master of Business Administration (MBA) programme offered in Universiti Sains Malaysia, Penang. The study also aims to help, not only the university but also other universities and colleges, public or private to understand the determinants that significant in explaining the intention towards an online education programme.

Despite of their popularity and advantages, web-based learning environments have many challenges (Dabbagh and Bannan-Ritland, 2005; Smaldino et al., 2005). According to Isman et al. (2004), Whipp and Chiarelli (2004), web-based learning requires skills and abilities which are not experienced in traditional classroom environment. Due to lack of face-to-face interactions in online learning environment, wed-based learners need to develop new self-regulatory abilities to fit the requirements of that learning setting (Dabbagh and Kitsantas, 2004; Picciano, 2001; Rovai, 2003; Saba, 2000). Unwillingness to change the learning atmosphere, poor level of competency in English, lack of funds and technical resources in universities, lack of confidence to practice computer applications coupled with absence of infrastructure such as electricity and telephone lines in many parts of the country are the most difficult issues to address in implementing e-learning for higher education in Bangladesh (Mahmud and Gzope, 2009). Other problems may include such factors as poor attendance, procrastination, feelings of isolation and a general lack of structure in the course (Brown, 2001; Kulik and Kulik, 1991; Fishman, 1999; Oliver, 1999; Olugbemiro et al., 1999; Joo et al., 2000; Wang and Newlin, 2000). These problems can limit the amount of participation and engagement with the course materials that are offered in the online environment.

Hiltz (1994) points out those students may withdraw from an online course because they do not manage the time required to be successful in the course. Another critical challenge to web-based learning is having very different profiles of students (Dutton et al., 2002; Picciano, 2001; Sikora and Carroll, 2003). Wide ranges of ages, married with kids, and working part-time or full-time are the main characteristics of the pool of the students in this learning environment (Simonson et al., 2003). Besides, the problem encountered by online programmes was also reflected in a survey of e-learning was carried out by Organization for Economic Cooperation and Development (OECD), in partnership with the UK-based Observatory on Borderless Higher Education (OBHE) in 19 tertiary education institutions in 13 countries. The result showed that fully online programmes account for well under 5% of total enrolments, though the student take-up of e-learning is growing in general (OECD, 2005). Thus, the OECD survey results support the claim that e-learning has not reached its full potential and hence, the e-learning providers might encounter difficulties in predicting the degree of intention to enrol the e-learning programme among potential learners (Abdel-Wahab, 2008). Asirvatham et al. (2005) conducted a survey of the readiness of e-learning system implementation in Malaysia, in 2004. The result showed that:

- Malaysia is moderately ready for e-learning

- Malaysia is not environmentally ready

- Malaysia is technically ready

- enablers are mostly ready, culturally

- learners are more ready for e-learning compared to the perception of their lecturers

- Malaysia is not seen as financially ready by providers and policy-makers.

Juhary (2003) highlights that students' preference to paper tutorial and notes which is opting the traditional method of learning. In addition, some students are still afraid of using the computers where their concerns range from fear of losing information to unfriendly system of e-learning (Abdul Karim and Mohd Yusof, 2003; Manochehri and Young, 2003). This statement describes the challenges and identifies rooms for improvement of the online education. Hence, it is essential for online education programme providers to understand the importance of exploring the factors that influences the intention to enrol the online programme. The Sloan Consortium survey found that among the eight major disciplines, namely engineering; psychology; social science and history; computer and information sciences; education; health professions and related sciences; liberal arts and sciences, general studies and humanities and business, business has the highest penetration rate of the eight major disciplines (Allen and Seaman, 2008). In this paper, a conceptual framework is developed to postulate causal links between the determinants and the intention to enrol an online graduate programme, in particular online MBA programme. Accordingly, the paper discusses the literature review especially on e-learning related topics. Then it is followed by methodology and analysis of data. The discussions and conclusions end the paper.

2   Literature review

2.1   E-learning

In view of the importance of the online education, various studies related to online learning have been carried out. These include a number of surveys that have been carried out to identify critical success factors in e-learning. Sulčič (2010) defined e-learning as a process in which students, teachers/tutors, developers and technical or administrative staffs are included and it depends on different external factors, such as market conditions, formal and jurisdiction framework, pedagogical and andragogical perspective and etc. Laudon and Laudon (1998) identified critical factors for successful implementation of e-learning programmes: management support, user participation, degree of complexity and risk according to the new technologies and role of project management in the implementation process. The reliability, quality and medium richness were also key technological aspects considered in defining successful factors for e-learning in Sanders Lopez and Nagelhout's (1995) study. In a survey done by Volery and Lord (2000) in one online management course at an Australian university, they identified three critical success factors in online delivery: technology, instructor and previous use of the technology from the student perspective. In addition to technology, which has been emphasised by some researchers, instructor attitudes toward students, instructor technical competence and classroom interaction are also important (Dillon and Gunawardena, 1995). In the meanwhile, Webster and Hackley (1997), emphasised effectiveness, where they used student involvement and participation, cognitive engagement, technology self-efficacy and perceived usefulness of technology employed to measure effectiveness of e-learning.

Hodges (2008) highlighted the importance of self-efficacy in online learning while a survey by Lim (2001) showed that computer self-efficacy is an important factor in adult learners' satisfaction and intent to take future web-based courses. Self-efficacy is affected by computer experiences and frequency of computer usage (Tarkzadeh and Koufteros, 1994). According to a study done by Hill et al. (2003), the quality of the lecturer and the student support systems were the most influential factors in the provision of quality education. Their empirical research made use of focus groups involving a range of higher education students. While studying the success of e-learning, there are a number of studies that point out challenges and issues in implementing e-learning. Nanayakkara (2007) introduced a theoretical framework for user acceptance of e-learning and presented the three key groups of factors: individual, system and organisational, that affecting the adoption of e-learning systems in the tertiary institutions in New Zealand. Bontempi (2003) suggested that barriers such as geographical distance, isolation from instructor and peers, lack of access to support such as libraries, technical assistance, financial aid, tutors and academic advisors, as well as factors that may influence the motivation of distance learners include age, gender, occupation, prior levels of knowledge and design interface should all be considered when designing distance learning programmes and the instruction should include elements that address and solve these issues.

Fletcher (1991), Hall (1997) and Haziah and Aziah (1997) stated in their studies that in general, students wanted learning that is flexible, relevant to their work situation, current, personalised, portable, focused, timely, affordable and valued. Kochman (1998); Miller et al. (1992); Seay and Milkman (1994) and Wheeler and Batchelder (1996) are

the researchers support the idea that online education system might inhibit a student from asking questions. Anderson et al. (2002) believed that students taking the course via online felt that their knowledge of the subject material increased less and that the course was of less value than students taking the class in the traditional format. Furthermore, Furst-Bowe and Dittman (2001) stated that online students often experienced some type of technical problem during their courses. Fear of technology seems to be one of the problems in enrolment in online programmes and Omatseye (1999) believed that it occurs because of the fear of unknown as online education development is still relatively in its early stages. Jadric et al. (2010) found that the amount of experience in using computers and the internet could also influence the success of online courses. On the other context, Flosi and Bandyopadhyay (2009) studied on course management software (CMS) in post-secondary institutions and found different sets of factors of teaching were found to be significantly related to the utilisation of the CMS system by post-secondary faculty.

The above statements indicated that the online education providers should take into the consideration on the student's perception towards the online programme and types of risks that the students may experience in joining the online course. Students tend to return to programmes that they perceive as effective and do not return to those that they perceive as ineffective (Johnson, 1998). Anderson et al. (2002) further stated that the academic programme itself could be affected negatively or even terminated because of adverse student attitudes. They also believed that student's frustration with the delivery system may have influenced their overall opinion of the instructor, which will affect course evaluation that consequently will affect the instructor's tenure and promotion decisions.

2.2   E-learning in Malaysia

It was highlighted that building world class human capital is one of the seven strategies for the development of Malaysia, under the 9th Malaysia Plan, second phase of 2010 vision. According to 9th Malaysia Plan (9MP), by the year 2010, it is expected that 40% of youth in the 17–20 cohort will be in higher education. Online education is one of the important modes of learning that is significantly helps to provide learning opportunities to those who cannot quite their job but has great enthusiasm to further their education. In view with this, Malaysian government took the initiative of establishing the e-learning centre, i.e., National E-Learning Centre (NELC) in the aim of promoting the e-learning in the country. According to Hassan's (2002) study and also a study done by Raja Hussain (2004), universities in Malaysia have responded actively to this challenge, guided by the Ministry of Education's strategies to enhance the use of ICT in the e-learning (Hassan, 2002; Raja Hussain, 2004). In Malaysia, there are a number of surveys that have been carried out to identify critical success factors, benefits, challenges and issues in implementing e-learning.

Goi and Ng (2009) believed that years of computer use and internet experience had a positive relationship with adult learner satisfaction in learning and higher satisfaction levels will lead to greater opportunities of taking a web-based programme in future. Therefore, they concluded that these factors were important influencers in e-learning programme enrolment for adult learners. A study to identify the success factors in implementing an e-learning programme in Malaysia carried out by Goi and Ng (2009) focused on eight criteria of success factors, which were programme content, web page accessibility, learners' participation and involvement, website security and support,

institution commitment, interactive learning environment, instructor competency and presentation and design.

Hong et al. (2003) investigated a web-based course at Universiti Malaysia Sarawak and reported that more than half of their participants had high level of acceptance with the web-based course. Their study also indicated that the participants found the web-based course to be a new learning experience and felt that they needed more guidance and time to adapt to the learning environments. Poon et al. (2004) observed web-based learning environments at several local universities in Malaysia and reported that the participants were not fully comfortable with e-learning, probably because the students were unfamiliar with the e-learning medium. However, Hong et al. (2003) and Poon et al. (2004) reported that students generally agreed that e-learning helped in their studies.

Nevertheless, few researches have showed a number of factors could influence learners' acceptance of e-learning. For example, studies carried out by Hong et al. (2003); Ndubisi and Chukwunonso (2004); Poon et al. (2004) found the students' and instructor's characteristics were the influencing factors. Technology support and system were key determinants as stated by Poon et al. (2004); Rafaeli and Sudweeks (1997). According to Passmore (2000) and Latifah and Ramli (2005), institutional support was the influencer to the learner's acceptance of e-learning. Selim (2005) and Rosenberg (2001) believed course content and knowledge management were the factors that could influence the acceptance of e-learning, while McDonald (2001); Webb et al. (1998) claimed that online tasks and discussion groups could influence learners' acceptance of e-learning.

2.3   Research models

There are various research models relating to the adoption of new services or technologies that exist in the literature. Theory of reasoned action (TRA), technology acceptance model (TAM) (Davis, 1989), unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003), motivational model (MM) and social cognitive theory (SCT) are among the well-known models used for studying the user acceptance and adoption. All these had their origins in psychology, sociology and commmuncations and are used to predict and explain user behaviour using various constructs of the independent variables (IVs).

2.3.1   Theory of reasoned action

TRA suggests that behavioural intention, influenced by attitude toward behaviour and subjective norm, leads to actual behaviour (Fishbein and Ajzen, 1975). TRA is one of the most fundamental theories of human behaviour, drawn from the social psychology and it has been used to predict a wide range of behaviours (Sheppard et al., 1988). The two core constructs of the TRA are attitude toward behaviour and subjective norm. Attitude toward any object can be seen as a function of his beliefs about the object and the evaluative aspects of those beliefs and the subjective norm is a person's belief that most of his important others think he should or should not perform the behaviour in question (Ajzen and Fishbein, 1980). Davis (1989) found that the variance explained was largely consistent with studies that had employed TRA in the context of other behaviours when reapplied TRA to individual acceptance of technology.

2.3.2 Technology acceptance model

TAM was an information systems (IS) theory that developed by Davis (1989) for studying the user acceptance and adoption of an IS or IT. The model proposes that users' acceptance of a new IS can be predicted by the users' perception of the ease of use and usefulness of the IS (Davis, 1989; Venkatesh and Davis, 2000). There are two specific variables, perceived usefulness and perceived ease of use, which are hypothesised to be fundamental determinants of user acceptance (Davis and Arbor, 1989). Davis (1989) defined the perceived ease of use in the TAM as "the degree to which a person believes that using a particular system would be free of effort" and the perceived usefulness as "the user's perception of the expected benefits derived from using a particular IS system" (Davis, 1989; Venkatesh, 2000).

A significant research by Venkatesh and Morris (2000) has shown that perceived usefulness has a positive effect on students' behaviour to use online learning while Sun et al. (2008) stated that perceived usefulness of the online learning system would positively influence the learners' satisfaction with online learning. Ong and Lai (2006) believe the perceived usefulness of the online learning will influence the behavioural intention to use such system so as the construct of 'ease of use'. In addition, Ong and Lai (2006) indicated that perceived ease of use also influences the behavioural intention of learners to use online learning. The relationships in the model of TAM had been confirmed by other IS researchers. Wangpipatwong et al. (2008) used the TAM as a based theoretical model in a study to understand the fundamental factors influencing the citizen's continuance intention to use e-government websites.

2.3.3 Unified theory of acceptance and use of technology

UTAUT was developed and formulated by Venkatesh et al. (2003). It extends TAM to take into account of several new constructs such as performance expectancy, effort expectancy and social influence that play significant roles in affecting the behavioural intention and ultimately usage of technologies. As a result, it is the consolidation of the constructs of eight important technology user acceptance models, i.e., the TRA, the TAM, the MM, theory of planned behaviour, a combined theory of planned behaviour and TAM, the model of personal computer utilisation, the innovation diffusion theory, and the SCT. The theory identifies the performance expectancy, effort expectancy, social influence and facilitating conditions as the four significant determinants of intention to use an IS and usage behaviour, while gender, age, experience and voluntariness of use moderate the key relationships in the model (Venkatesh et al., 2003). Anderson and Schwager (2003) applied UTAUT model in a study of small and medium enterprises' adoption of wireless LAN technology. According to Venkatesh et al. (2003), UTAUT was able to explain 70% of technology acceptance behaviour, a considerable improvement on previous models which routinely explain over 40% of acceptance.

2.3.4 Social cognitive theory

Bandura (1986) claimed that one of the most powerful theories of human behaviour is SCT. Compeau and Higgins (1995) applied SCT to the context of computer utilisation and also employed it to the study performance. There are five core constructs in SCT:

1 outcome expectations – performance

2 outcome expectations – personal

3 self-efficacy

4 affect

5 anxiety.

Compeau and Higgins (1995) defined outcome expectations – performance as the performance-related consequences of the behaviour, specifically, performance expectations deal with job related outcomes while outcome expectations – personal as the personal consequences of the behaviour, specifically, deal with the individual esteem and sense of accomplishment. According to them, affect means an individual like for a particular behaviour (e.g., computer use). Bandura (1986) defines self-efficacy as "People's judgments of their capabilities to organise and execute courses of action required to attain designated types of performances. It is concerned not with the skills one has but with the judgments of what one can do with whatever skills one possesses." Computer self-efficacy is defined as the judgment of one's capability to use an IT according to Agarwal and Karahanna (2000), Compeau and Higgins (1995), Gist (1989) and Gist et al. (1989). Computer anxiety describes the tendency of individuals to be uneasy, apprehensive or fearful about current or future use of computers (Igbaria and Parasuraman, 1989). According to Lateh and Raman (2005), the learners' anxiety can decrease their tendency to use online learning technologies. Similarly in the research findings by Rezaei et al. (2008), computer anxiety has a negative effect on students' intention to use an online learning system. Saadé and Kira (2006) reported that learners' anxiety seems to be an important variable in relation to students' perceptions of online courses.

2.3.5 Motivational model

Motivation is a key factor determining human behaviour and action (Lin, 2007). Two core constructs of motivation, extrinsic and intrinsic, have been defined in the MM. Extrinsic motivation refers to the performance of an activity because it leads to instrumental rewards (Saadé, 2007; Venkatesh, 1999) while intrinsic motivation refers to the performance of an activity for its inherent interests and enjoyment other than a separable outcome (Deci, 1972). Several studies have examined motivational theory and adapted it for various contexts and studies. According to Lee et al. (2005), TAM mainly emphasises extrinsic perspective. Recently researchers began to address the role of intrinsic motivation in TAM studies in order to provide a broader view and a better explanation of IT adoption (Agarwal and Karahanna, 2000; Heijden, 2003; Hsu and Lu, 2004; Moon and Kim, 2001; Saadé and Bahli, 2005). Ghani and Deshpande (1994); Saadé (2007); Thompson et al. (1991) found that the intrinsic motivation while using the WLS was a significant predictor of outcomes related to its use and acceptance. Davis et al. (1992) applied motivational theory to understand new technology adoption and use (Venkatesh and Speier, 1999). According to Jadric et al. (2010), motivation is one of the most important components of students' success in the e-learning environment while ICT skills and internet access are other important factors.

2.4   *The intention to enrol an online graduate programme*

Ajzen (1991) defines intention as an indication of a person's readiness to perform a given behaviour and it is considered to be the immediate antecedent of behaviour. He describes that the intention is based on attitude toward the behaviour, subjective norm and perceived behavioural control, with each predictor weighted for its importance in relation to the behaviour and population of interest. TRA is a well-researched intention model that has proven successful in predicting and explaining behaviour across a wide variety of domains, including research of technology acceptance (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975). According to TRA, a person's performance of a specified behaviour is determined by his or her behavioural intention to perform the behaviour, and behaviour is jointly determined by the person's attitude and subjective norms concerning the behaviour in question (Algahtani and King, 1999). Intention to perform a particular behaviour has been shown to be an effective predictor of the actual behaviour itself (Ajzen and Fishbein, 1980).

2.5   *Theoretical framework*

A review of literature is initially used to identify the key variables that affect the intention to enrol an online MBA programme. In this study, the determinants are considered as the IVs, age and gender are moderators and the dependent variable (DV) is the intention to enrol an online graduate programme, which is targeted as the online MBA offered by USM. The IVs are categorised into four main groups: learner characteristics, institution characteristics, technology characteristics and the perceived risks. These four main factors are further framed around sub-factors groupings. The sub-factors are adapted from various research models such as TRA, MM, UTAUT, SCT and TAM models. A theoretical framework is built and illustrated in Figure 1.

2.5.1   *Learner characteristics*

Poon et al. (2004), Folorunso et al. (2006), Selim (2005) and Volery and Lord (2000) claimed that students' characteristics such as their satisfactions with time and place flexibility of the system; students' involvement and participation; students' cognitive engagement; students' level of self-confidence; students' technology self-efficacy; students' initiative and motivation and students' anxiety could influence acceptance of e-learning among students. In this study, 'learner characteristics' is the main factor which consists of four sub-factors or constructs, i.e., attitude, intrinsic motivation, social influence and computer self-efficacy. Attitude is adapted from TAM model. The attitude refers to the attitudes toward using a particular system, i.e., e-learning system in this study. Learner attitude is defined as learners' impression about performing the target behaviour (Fishbein and Ajzen, 1975). According to Ong and Lai (2006), understanding students' attitude towards online learning can help to determine the extent to which students utilise the online system. Learners' attitudes toward computers and online courses will positively influence learners' satisfaction and acceptance of online learning (Sun et al., 2008). Conversely, Tang et al. (2009) reported that negative attitude such as having less interest and negative impression will influence a learner's readiness to accept online learning.

Figure 1   Theoretical framework
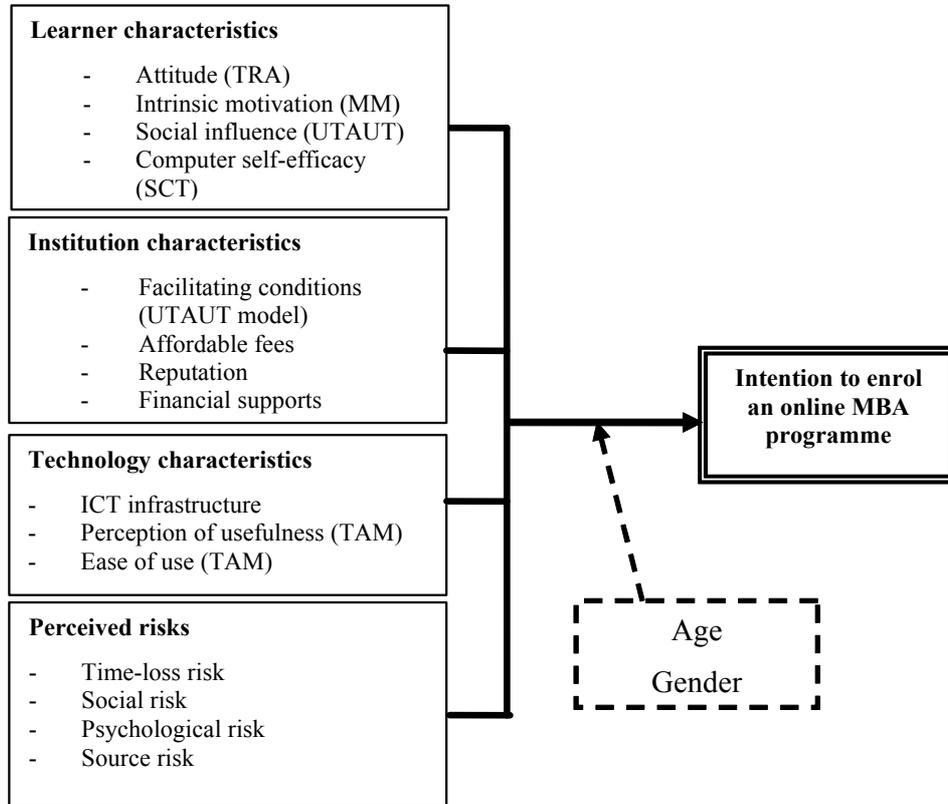
2.5.2   *Institution characteristics*

The institution characteristics in this study refer to the attributes relevant to the institution which provides an online graduate programme. Four constructs under the institution characteristics are identified as facilitating conditions, reputation, affordable fees and financial supports. Facilitating conditions are adapted from UTAUT model and it is defined as the degree to which an individual believes that an organisational and technical infrastructure exists to support use of the system (Venkatesh et al., 2003). According to Gray et al. (2003), reputation of the institution includes brand name of institution, achievements of institution, high standard of education, quality of courses and the experience of the institution. In a study carried out by Mat Hassan et al. (2008), another consideration of students' choice of higher institution of learning would be the tuition fees. Students would definitely choose an institution which provides an affordable fee. Lacks of student funding and financial difficulties have also become significant factors of withdrawal from higher education (Aldridge and Rowley, 2001; Association of University Teachers, 2001; Bennett, 2003). Accordingly, one of the supports needed from the government can be the provision of funding.

2.5.3 Technology characteristics

Technology has become the most powerful tool in almost every aspect of human's daily life and it is regarded as a major revolution that has a significant impact on education (Tang et al., 2009). According to Horton and Horton (2003), trends in technology influence education and knowledge management. The constructs of the technology characteristics include the infrastructure of the ICT and another two constructs that are adapted from TAM model, i.e., perception of usefulness and ease of use that are adapted from TAM model. Infrastructure of the technology and technical support of e-learning system are among other factors contributing to the acceptance of e-learning (Folorunso et al., 2006; Poon et al., 2004; Selim, 2005). Rafaeli and Sudweeks (1997) reported that if the technology and communication technology used were reliable, students studied better in e-learning environment and had higher e-learning acceptance. Bacsich et al. (2009) claimed that development of online programmes in these universities has been limited up to now, possibly constrained by limitations in ICT infrastructure.

2.5.4 Perceived risks

Bauer (1960) introduced the perceived risks into the marketing literature. It has become a common construct used by researchers in consumer behaviour (Chaudhuri, 1998; Hoover et al., 1978), organisational behaviour (Doney and Cannon, 1997) and online consumer behaviour (Archer and Yuan, 2000; Gifford and Bernard, 2006; Ha, 2002). According to Jacoby and Kaplan (1972), there are multidimensional constructs entailing multiple types of risk, including financial, performance, physical, psychological, and social risk. Other dimensions of perceived risk are added by different researchers such as time risk (Roselius, 1971), source credibility risk (McCorkle, 1990) and privacy risk (Elliot, 1995). Four factors, i.e., performance risk, time-loss risk, psychological and source risk were found strongly predictive of online education enrolment according to Mohamed and Hassan (2008). In this study, four constructs that contained in perceived risks are identified as time-loss risk, social risk, psychological risk and perceived source risk. These types of risks are adapted from Mohamed and Hassan's (2008) study.

2.5.5 Moderating variables – age and gender

Age and gender differences have been shown to exist in technology adoption contexts also (Venkatesh and Morris, 2000). Levy (1988) suggests that studies of gender differences can be misleading without reference to age. Hence, both age and gender have been incorporated into this study as a moderator to assess if the effects to the relationship between the determinants and the intention to enrol an online graduate programme.

Figure 1 was developed to study the intention to enrol an online MBA programme. Accordingly, 12 hypotheses will be tested.

H1   Learner characteristics have significant impact on the intention to enrol an online MBA programme.

H2   Institution characteristics have significant impact on the intention to enrol an online MBA programme.

H3   Technology characteristics have significant impact on the intention to enrol an online MBA programme.

H4   There is a negative relationship between the perceived risks and the intention to enrol an online MBA programme.

H5   The influence of learner characteristics on the intention will be moderated by age such that the effect will be greater with the increase of age.

H6   The influence of institution characteristics on the intention will be moderated by age such that the effect will be greater with the increase of age.

H7   The influence of technology characteristics on the intention will be moderated by age such that the effect will be greater with the increase of age.

H8   The influence of perceived risks on the intention will be moderated by age such that the negative effect will be greater with the increase of age.

H9   The influence of learner characteristics on the intention will be moderated by gender.

H10 The influence of institution characteristics on the intention will be moderated by gender.

H11 The influence of technology characteristics on the intention will be moderated by gender.

H12 The influence of perceived risks on the intention will be moderated by gender.

3   Research design

A population refers to the entire group of people, events or topics of interest that the researcher wishes to investigate (Sekaran, 2003). The target population of this study is adults in Malaysia. They include the working adults, elders, employed person, married people or any adult who has obtained the first degree and yet with great enthusiasm, to further seek for a graduate degree. As the study aims to investigate the intention to enrol online MBA, the targeted group needs to have at least an undergraduate degree, i.e., a bachelor degree. Nevertheless, they are savvy group that able to make their own decision to take up any distance education programme. Four IVs and one DV are explored from the conceptual model of this study. The IVs are learner characteristics; institution characteristics; technology characteristics and perceived risks, while the intention to enrol an online MBA programme is the DV. Accordingly, by factor in the number of lost, misplaced, invalid and not responded questionnaires, 180 is the target sample size of this study. The sampling technique used for this study is based on convenience sampling. An individual is used as the unit of analysis of this study due to the aim of the study, which is to understand and identify the determinants that may influence the individual's intention to enrol an online MBA programme.

3.1   Construct measures

This study has identified four IVs as main determinants that influence the intention to enrol an online MBA programme and these variables are further categorised into 15 constructs. The constructs are the sub-factors identified in the four respective main factors. The scale development for these constructs and its measures are adapted from the

previous literatures by some researchers as well as adapted from various TAMs such as TRA, MM, UTAUT, SCT and TAM.

3.1.1 Measurement of IVs

From the theoretical framework, the determinants are defined as IVs of this study. Hence, they are the four main factors, namely learner characteristics, institution characteristics, technology characteristics and perceived risks. These variables are further framed into 15 constructs, i.e., four constructs are grouped under 'learner characteristics', 'institution characteristics' and 'perceived risks' while three constructs under technology respectively. The items use to measure these constructs are adapted from the studies of some researchers. There are four constructs defined under this variable, namely attitude, intrinsic motivation, social influence and computer self-efficacy. The construct 'attitude' is adapted from the theory TRA and the items to measure this construct are adapted from Abdel-Wahab (2008) while the second construct, 'intrinsic motivation' is adapted from MM. Two items used to measure the intrinsic motivation and they are adapted from the literature of Saadé et al. (2009). The third construct, 'social influence' consists of two items and these items are adapted from Venkatesh et al.'s (2003) study. There are six items used to measure the construct 'computer self-efficacy' and these items are adapted from the study of Compeau and Higgins (1995).

Facilitating conditions, affordable fee, reputation and financial supports are constructs related to this variable. There are four items used to measure the construct of facilitating conditions and they are adapted from Venkatesh et al.'s (2003) study. Two items are used to measure the construct 'affordable fee' and 'financial supports' while five items adapted from a study by Gray et al. (2003) are used to measure the construct of reputation. Among three constructs of the technology characteristics, two are adapted from TAM model, i.e., perceived of usefulness and ease of use. Three items used to measure the construct of ICT's infrastructure. The items used to represent the measure of 'perception of usefulness' and 'ease of use' are adapted from Davis's study (1989). Four constructs with the total of 14-item scale, are adapted from a study conducted by Mohamed and Hassan (2008).

3.1.2 Measurement of DVs

In this study, the intention to enrol an online MBA programme is the DV that is of the interest. Five items, which are adapted from the research study of Saadé et al. (2009); and Mohamed and Hassan (2008) are identified as measurement scales for the DV.

4   Analysis

A total of 180 questionnaires were distributed to the target respondents via both e-mail and hardcopy by using convenience-sampling technique. Each of the returned questionnaires was checked for the completeness and reasonableness. Out of the 180 questionnaires distributed, 120 questionnaires were received and were usable for the purpose of this study. Hence, the response rate was 67%. The number of male and female respondents is not significantly different. This indicates that the survey was equally responded from the gender perspective. Amongst them, 80.8% of the respondents were

Chinese, followed by 12.5% Malay, 5.8% Indian and 0.8% from other races. Majority of the respondents are below 36 years old and with at least a bachelor's degree. Majority of the respondents were from the field of manufacturing or engineering, of which 63.3% of them were holding a management position. Nearly 16.7% of the total respondents had been attached to the company for more than ten years while 61.7% had less than five years working experience with the company.

4.1 Factor analysis

Four constructs were initiated under this variable to evaluate the influence of learner characteristics to the intention to enrol an online MBA programme. They are attitude, intrinsic motivation, social influence and computer self-efficacy. After dropping those indicator items that were unable to fulfil the above conditions, the final results as indicated in Table 1. The result shows that Barlett's test was significant ($p < 0.05$) and the KMO was at acceptable level. The inspection of the anti-image correlation matrix showed the value of each diagonal element was also well above acceptable level of .50. Nonetheless, according to Igbaria et al. (1995) suggested that only variable with the loading greater than 0.50 and cross loading lower than 0.35 were concluded that had unique relationship with the factor. After reviewing the grouping of the factors by following the mentioned guideline by Igbaria et al. (1995), the initial four constructs with total of 13 items had been reduced to eight items which were grouped under three factors as indicated in Table 1. The label for these three factors was remained unchanged since there was no combined item from other domains. The label for the factors extracted as follows:

Factor 1   Computer self-efficacy (included four items of computer self-efficacy).

Factor 2   Intrinsic motivation (included two items from intrinsic motivation).

Factor 3   Attitude (included two items from attitude).

Table 1   Factors loading for learner characteristics

Items	Factors		
	1	*2*	*3*
Learner attitude (L12)	−.189	−.008	*.786*
Learner attitude (L13)	.193	.134	*.786*
Learner intrinsic motivation (L21)	.080	*.948*	.045
Learner intrinsic motivation (L22)	.078	*.923*	.087
Learner computer self-efficacy (L41)	*.707*	.309	−.057
Learner computer self-efficacy (L42)	*.744*	.169	−.179
Learner computer self-efficacy (L43)	*.806*	−.087	.253
Learner computer self-efficacy (L44)	*.799*	−.041	.005
Eigen value	2.427	1.901	1.345
% variance (70.92)	30.33	23.77	16.82

Note: Loadings in italics indicate the inclusion of that item in the factor.

There were four constructs for institution characteristics, namely facilitating conditions, fees, reputation and financial supports initiated in this variable. The analysis process conducted for the variable, learner characteristics was repeated for this variable. The first factor analysis showed that both Bartlett's test of sphericity was significant ($p < 0.05$) and the Kaiser-Meyer-Olkin measure of the sampling adequacy was also greater than 0.50. Inspection of the anti-image of the correlation matrix was also well above the acceptable level of .50. However, second factor analysis was conducted due to failure in meeting the condition of factor loadings for item #I21 and I22. Hence, these items had been dropped from further analysis. The final findings for KMO and Barlett's test were showed in Table 2. Three components with Eigen value more than one were extracted with total of 78.62% variance had been explained. The factor analysis had helped to reduce the original four constructs to three. Three factors were extracted and 11 items were categorised under them as showed in Table 2. The label of these factors remained as original, i.e.,

Factor 1   Reputation (five items that represented reputations were included).

Factor 2   Facilitating condition (four items from facilitating condition).

Factor 3   Financial supports (included two items of financial supports).

Table 2   Factor loading for institution characteristics

Items	Factors		
	1	*2*	*3*
Institution facilitating (I11)	.235	*.872*	.060
Institution facilitating (I12)	.303	*.848*	.143
Institution facilitating (I13)	.194	*.829*	.135
Institution facilitating (I14)	.299	*.796*	.192
Institution reputation (I31)	*.832*	.186	.012
Institution reputation (I32)	*.695*	.211	.198
Institution reputation (I33)	*.855*	.248	.153
Institution reputation (I34)	*.803*	.297	.246
Institution reputation (I35)	*.806*	.294	.235
Institution financial supports (I41)	.195	.174	*.907*
Institution financial supports (I42)	.215	.142	*.917*
Eigen value	3.560	3.166	1.922
% variance (78.62)	32.37	28.78	17.47

Note: Loadings in italics indicate the inclusion of that item in the factor.

There were three constructs for technologies characteristics which consist of ten items, contained in this variable. The respective constructs were ICT infrastructure, perception of usefulness and ease of use. The Bartlett test of sphericity was significant, the Kaiser-Meyer-Olkin measure of the sampling adequacy (KMO = 0.853) and the anti-image of the correlation matrix were above the acceptable level of 0.50. Two

components with Eigen value more than one had been extracted and total of 74.1% variance had been explained as the result of the second factor analysis. Ten items that were initially grouped under three constructs had been reduced to ten items contained in two constructs, by combining the construct of perception of usefulness and ease of use into one. The result of factor loadings was illustrated in Table 3. As a result of this analysis and to reflect the essential contents contained in the variables, a new name, technology acceptance was assigned to the combined construct since it consists of two main constructs from TAM model. The new labels were as follows:

Factor 1   Technology acceptance (consisted of four items from perception of usefulness and three items from ease of use).

Factor 2   ICT infrastructure (consisted of three items from original domain).

Table 3   Factor loading for technology characteristics

Items	Factors	
	1	*2*
Technology infrastructure (T11)	.144	*.919*
Technology infrastructure (T12)	.190	*.941*
Technology infrastructure (T13)	.208	*.929*
Technology perception of usefulness (T21)	*.750*	.301
Technology perception of usefulness (T22)	*.738*	.216
Technology perception of usefulness (T23)	*.853*	.018
Technology perception of usefulness (T24)	*.860*	.097
Technology ease of use (T31)	*.800*	.263
Technology ease of use (T32)	*.793*	.261
Technology ease of use (T33)	*.765*	.082
Eigen value	4.527	2.886
% variance (75.50)	45.27	28.86

Note: Loadings in italics indicate the inclusion of that item in the factor.

There were four constructs contained in this variable. Fourteen items had been identified as relevant to this variable. Principal component analysis was used in this factor analysis. The Bartlett's test of sphericity was significant since $p < 0.05$. The Kaiser-Meyer-Olkin measure of the sampling adequacy was also acceptable as well as the value for anti-image correlation. However, factor analysis process had been repeated for few times for this variable due to failure of meeting the factor loadings. Accordingly, the factor analysis had reduced the number of items from 14 items to five. Two factors had been extracted with total of 83.54% variance had been explained. Table 4 illustrated factors loading for perceived risks. The label for both factors remained unchanged:

Factor 1   Social risk (contained three items from original social risk).

Factor 2   Source risk (contained two items from source risk).

Table 4   Factor loading for perceived risks

Items	Factors	
	1	*2*
Perceived risks social (R21)	*.899*	.099
Perceived risks social (R22)	*.917*	.114
Perceived risks social (R23)	*.852*	.139
Perceived risks source (R41)	.134	*.928*
Perceived risks source (R42)	.112	*.932*
Eigen value	2.404	1.773
% variance (83.54)	48.08	35.46

Note: Extraction method: principal component analysis

There were six items contained in this DV. Similarly, principal component analysis was used for the purpose of factor analysis. The Bartlett test of sphericity was significant since *p*-value < 0.05. The Kaiser-Meyer-Olkin measure of the sampling adequacy was above acceptable level of 0.50, i.e., 0.82 and each diagonal element in the anti-image correlation matrix had value more than 0.50. All the conditions were met in the factor analysis process except item IE11. Hence, it was dropped. There was only a single factor with the eigen value greater than one that has been extracted, and 68.45% of the variance has been explained. Rotation was not necessary for this case since only a single factor extracted. The factor loading for this single factor was shown in Table 5. The label of the factor remained unchanged.

Table 5   Factor loading for intention to enrol an online MBA programme

Items	Factor
	1
Intention to enrol (IE12)	.821
Intention to enrol (IE13)	.823
Intention to enrol (IE14)	.820
Intention to enrol (IE15)	.846
Eigen value	2.738
% variance	68.45

Note: Extraction method: principal component analysis

4.2   *Reliability analysis*

The reliability analysis was done for each construct separately. Table 6 reported that the Cronbach's alpha for each of the factors. Items in the 'Attitude' construct were dropped due to the Cronbach's alpha below the acceptable level. The Cronbach's alpha ranged from .77 to .95 after removing these items. Hence, total of two items were deleted from further analysis.

Table 6 Reliability analysis

| Factors	No. of items	Item dropped	Cronbach's alpha
Attitude	2	2	*.44**
Intrinsic motivation	2	0	.89
Computer self-efficacy	4	0	.77
Facilitating condition	4	0	.91
Reputation	5	0	.91
Financial supports	2	0	.90
ICT infrastructure	3	0	.95
Technology acceptance	7	0	.92
Social risk	3	0	.88
General risk (*change to source risk*)	2	0	.87
Intention to enrol	4	0	.84

Note: *To be removed from future analysis

4.3 Revision of theoretical framework and hypotheses

The factor analysis had helped to reduce a number of domains or constructs in this study. Four constructs in the IV, learner characteristics and institution characteristics were reduced to two and three respectively. While the three original constructs in the variable 'technology characteristics' was combined to two, the four constructs in the variable 'perceived risks' were also reduced to two. The number of items in the DV 'intention to enrol' was reduced from five to four. The details of the changes were summarised in Table 7. The initial theoretical framework has been revised and is presented in Figure 2.

Based on the revised theoretical framework, there was no change to the 12 main hypotheses, i.e., H1, H2, H3, H4, H5, H6, H7, H8, H9, H10, H11 and H12. These set of hypotheses will be tested.

Table 7 Summary of the change in the constructs after factor analysis

Variables	Constructs (old) before factor analysis	Constructs (new) after factor analysis
Learner	Attitude Intrinsic motivation Social influence Computer self-efficacy	Intrinsic motivation Computer self-efficacy
Institution	Facilitating condition Fee Reputation Financial supports	Facilitating condition Reputation Financial supports
Technology	ICT infrastructure Perception of usefulness Ease of use	ICT infrastructure Technology acceptance
Perceived risks	Time loss risk Social risk Psychological risk Source risk	Social risk Source risk

Figure 2   Revised theoretical framework
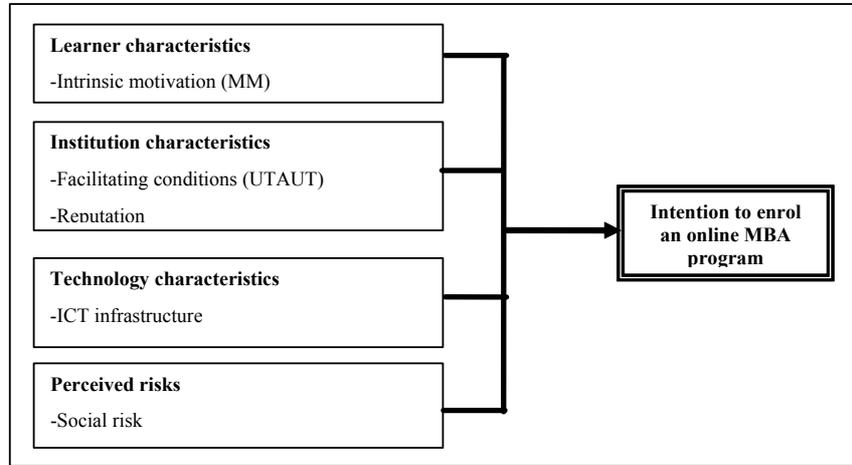
Table 8   Pearson's correlations coefficients of the study factors

Factors	1	2	3	4	5	6	7	8	9	10
1	1									
2	.186*	1								
3	.354**	.395**	1							
4	.205*	.395**	.573**	1						
5	.129	.106	.363**	.434**	1					
6	.247**	.242**	.556**	.696**	.484**	1				
7	.507**	.277**	.551**	.403**	.330**	.398**	1			
8	−.366**	−.035	−.179	.094	−.039	−.017	−.281**	1		
9	.084	.377**	.185*	.472**	.158	.296**	.165	.259**	1	
10	.395**	.316**	.417**	.222*	.340**	.302**	.536**	−.340**	.078	1

Notes: Factor 1 – intrinsic motivation; Factor 2 – computer self-efficacy;
Factor 3 – facilitating condition; Factor 4 – reputation;
Factor 5 – financial support; Factor 6 – ICT infrastructure;
Factor 7 – technology acceptance; Factor 8 – social risk;
Factor 9 – source risk; Factor 10 – intention
*correlation is significant at the 0.05 level (two-tailed)
**correlation is significant at the 0.01 level (two-tailed)

4.4   Correlations

Correlation analysis is performed on the variables to determine the strength and direction of the linear relationship between IVs and the DV. In this study, Pearson correlation was deployed. Pearson correlation coefficient (r) was used to describe the relationship between two variables. Its value ranges from –1.00 to 1.00, of which $r = 0$ indicates that no relationship; $r = 1$ indicates a perfect positive relationship while $r = -1$ indicates a perfect negative relationship. High correlation between IVs could result in multicollinearity problem. Table 8 reported the results of the inter-correlation of the

variables. The results indicated that all variables except source risk have significant correlations with the DV, intention to enrol an online MBA programme at significance level of 0.01 and 0.05.

4.5   Hypotheses testing

Multiple regression analysis is a method used to assess the effects of two or more IVs on a single DV which is interval-scaled or ratio scaled. Hence, in this study, multiple regression analysis was used to test the influence of four IVs to the DV, intention to enrol an online MBA programme. Hypotheses H1, H2, H3 and H4 were tested using the multiple regression analysis since there were four IVs against one DV. The moderating effects of age and gender in association to the relationship between these IVs and DV, i.e., hypotheses H5, H6, H7, H8, H9, H10, H11 and H12 were also being tested. The statistical technique used to test the hypotheses H5, H6, H7, H8, H9, H10, H11 and H12 was hierarchical regression analysis.

4.5.1   Multiple regressions

The first multiple regression analysis was executed and evaluated to assess the influence of four IVs, namely learner characteristics, institution characteristics, technology characteristics and perceived risks to the DV, intention to enrol an online MBA programme. The relevant hypotheses to be assessed in this multiple regression were:

H1   Learner characteristics have significant impact on the intention to enrol an online MBA programme.

H2   Institution characteristics have significant impact on the intention to enrol an online MBA programme.

H3   Technology characteristics have significant impact on the intention to enrol an online MBA programme.

H4   There is a negative relationship between the perceived risks and the intention to enrol an online MBA programme.

Intention to enrol was entered as DV and learner, institution, technology and perceived risks were entered as IVs. The assumptions of multiple regression analysis have also been assessed in this study. The histogram, in a bell-shape and with a mean of near to zero and standard deviation close to one indicated that the data was normally distributed. In the meanwhile, the normality assumption of residue or error term in regression model can be examined through the normal probability plot. The normal P-P plot of regression standardised residual showed the points were close to a diagonal line. This indicated that the assumption of normality was satisfied. The Durbin-Watson statistic of 1.84 revealed the independence of error term.

Another two important assumptions required to assess were the multicollinearity among the variables and outliers. In this study, variance inflation factor (VIF) and condition index were used to test multicollinearity. General guidelines of $VIF < 10$ and condition index below 30 are applied if the multicollinearity is not present. The VIF for each IV shown in the collinearity statistic of 'coefficient' matrix was below ten and the condition indices were below the safety limit of 30. Hence, it was concluded that no

collinearity issue among IVs. Casewise diagnostics in SPSS could help to detect if outliers exist. Any outlier needs to be removed and the regression analysis needs to be re-run. However, in this test, no outlier was detected. The result of the multiple regressions is presented in Table 9.

Table 9   Regression results on IVs against DV

Variables	Standardised coefficients beta
Learner characteristics	.286**
Institution characteristics	.146
Technology characteristics	.247*
Perceived risks	−.209**
R square	*.346*
Adjusted R square	*.323*
F value	*15.201*
D-W	*1.839*

Notes: **$p < 0.01$ and *$p < 0.05$

Approximately, 35% variations of the intention to enrol an online MBA programme can be explained by the four IVs, namely learner, institution, technology and perceived risks. The adjusted R square was 0.323. The Durbin-Watson (D-W) test is used to check if the error terms in the regression model are independent. The D-W statistic of 1.84 was within the acceptance level and hence, the error terms were independent. From Table 9, it was observed that the significant IVs that influence the intention to enrol an online MBA programme were learner characteristics (beta = 0.286 and $p < 0.01$), technology (beta = 0.247 and p-value < 0.05) and perceived risks with beta = −.209 and $p < 0.01$. Conversely, institution characteristics where the p-value is more than 0.05 indicated that it had no significant impact to the intention. The value of the standardised beta for each variable depicted in this table was the coefficient of the respective variable in the fitted multiple regression model. The model can be developed to predict the magnitude of change in each IV to the DV.

4.5.2 Hierarchical regression

The hierarchical regression was run to understand the moderating effects of age and gender in the relationship model. Hypotheses 5, 6, 7 and 8 used to evaluate the moderating effect of age to the relationship model while hypotheses 9, 10, 11 and 12 used to evaluate the moderating effect of gender to the relationship model.

4.5.2.1 Moderating effect of age

The hierarchical regression analysis indicated that there was a significant interaction between age and risk at $p < .05$. The beta value (standardise coefficients) of the interaction term ($\beta = -.173$) indicates that the negative relationship between risk and intention to enrol an online MBA programme will be stronger for older learners, i.e., the effect of risk to the intention to enrol an online programme will be more salient with the increase of age. This shows evidence that the negative relationship between risk and intention to enrol an online graduate programme was moderated by age.

From Table 10, R^2 of the model increases to 39.7% when age was included as a moderator. The influence of perceived risks to the intention to enrol an online programme was greater among the older learners and hence, it was concluded that it moderates the negative relationship between the perceived risks and the intention. The moderating effect of age is further described in Figure 3. On the other hand, it has non-significant moderating effect to the relationship between the other three variables and intention. Hence, hypotheses 5, 6 and 7 were rejected except hypotheses 8 was accepted at 95% confidence level ($p < .05$).

Table 10 Hierarchical regression using age as moderator in the relationship between four main variables and intention to enrol an online MBA programme

	Model 1	*Model 2*	*Model 3*
Independent variable			
Learner characteristics	.286**	.275**	.280**
Institution characteristics	.146	.126	.095
Technology characteristics	.247*	.264*	.311*
Perceived risks	−.209**	−.190*	−.172*
Moderating variable			
Age		−.102	−.086
Interaction terms			
Age × Learner characteristics			.073
Age × Institution characteristics			.029
Age × Technology			−.137
Age × Perceived risks			−.173*
R^2	.346	.356	.397
Adjusted R^2	.323	.327	.348
R^2 change	.346	.010	.042
Sig. F change	.000	.190	.115

Notes: **$p < .01$ and *$p < .05$

Figure 3 Moderating effect of age on risk
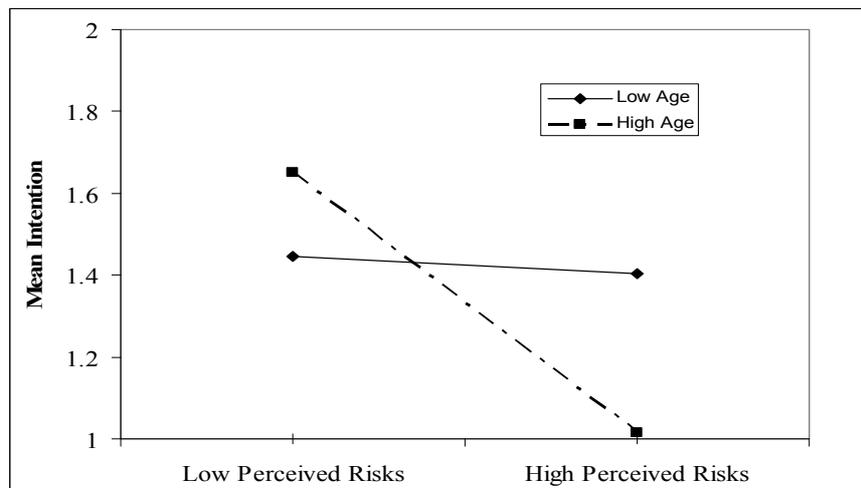
4.5.2.2 *Moderating effect of gender*

Based on Table 11, it was noted that gender has not significantly moderated the relationship between all IVs and the intention. This means there was no moderating effect of gender in association to the relationship model. The change in R square was insignificant (less than 2%). Hence, it can be concluded that gender was not a significant moderator to the four IVs, namely learner characteristics, institution characteristics, technology characteristics and perceived risks. Therefore, all hypotheses 9, 10, 11 and 12 were rejected at both $p < .01$ and $p < 0.05$.

Table 11   Hierarchical regression using gender as moderator in the relationship between four main variables and intention to enrol an online MBA programme

	Model 1	*Model 2*	*Model 3*
Independent variable			
Learner characteristics	.286**	.300**	.233
Institution characteristics	.146	.140	.044
Technology characteristics	.247*	.241*	.603
Perceived risks	−.209**	−.202**	.009
Moderating variable			
Age		−.078	−.077
Interaction terms			
Gender × Learner characteristics			.057
Gender × Institution characteristics			.150
Gender × Technology characteristics			−.408
Gender × Perceived risks			−.211
R^2	.346	.352	.362
Adjusted R^2	.323	.323	.310
R^2 *change*	.346	.006	.010
Sig. F change	.000	.308	.782

Notes: **$p < .01$ and *$p < .05$

4.6 *Conclusions for hypotheses*

Among 12 main hypotheses tested in the first stage, four were accepted while H2, H5, H6, H7, H9, H10, H11 and H12 were rejected at both 0.01 and 0.05 significance level. The result of these hypotheses testing was revealed in Table 12. Based on Table 12, it can be concluded that learner characteristics, technology characteristics and perceived risks have significant impact on the intention to enrol an online MBA programme. Amongst them, 'learner characteristics' has a strongest impact to the intention to enrol an online MBA programme. Further analysis has drawn to the conclusion that intrinsic motivation and computer self-efficacy contained in 'learner characteristics', technology acceptance contained in 'technology characteristics' and social risk in 'perceived risks' were significant determinants of the intention to enrol an online MBA programme. All these

individual determinants were positively related to the intention except social risk, which was a negative determinant to the intention.

Table 12 Summary of the hypotheses testing

Hypotheses	Descriptions	Result	Beta
	Multiple regression		
H1	Learner characteristics have significant impact on the intention to enrol an online MBA programme.	Accepted	$\beta = .286**$
H2	Institution characteristics have significant impact on the intention to enrol an online MBA programme.	Rejected	$\beta = .146$
H3	Technology characteristics have significant impact on the intention to enrol an online MBA programme.	Accepted	$\beta = .247*$
H4	There is a negative relationship between the perceived risks and the intention to enrol an online MBA programme.	Accepted	$\beta = -.209$
	Hierarchical regression		
H5	The influence of learner characteristics on the intention will be moderated by age such that the effect will be greater with the increase of age.	Rejected	$\beta = .073$
H6	The influence of institution characteristics on the intention will be moderated by age such that the effect will be greater with the increase of age.	Rejected	$\beta = .029$
H7	The influence of technology characteristics on the intention will be moderated by age such that the effect will be greater with the increase of age.	Rejected	$\beta = -.137$
H8	The influence of perceived risks on the intention will be moderated by age such that the negative effect will be greater with the increase of age.	Accepted	$\beta = -.173*$
H9	The influence of learner characteristics on the intention will be moderated by gender.	Rejected	$\beta = .057$
H10	The influence of institution characteristics on the intention will be moderated by gender.	Rejected	$\beta = .150$
H11	The influence of technology characteristics on the intention will be moderated by gender.	Rejected	$\beta = -.408$
H12	The influence of perceived risks on the intention will be moderated by gender.	Rejected	$\beta = -.211$

5 Discussion

5.1 Discussion of major findings

The study has showed that learner, technology and perceived risks have significant impact to the intention to enrol an online MBA programme. The regression tests had presented a moderate inference with R square of .346. This indicated that approximately 35% variations of the intention to enrol an online MBA programme can be explained by these determinants. Among these variables, learner characteristics depicted as the

strongest impact to the intention (beta = .286). It was also reported that age has significant moderating effect on risk in association to the intention to enrol an online MBA programme. The influence of perceived risks to the intention to enrol an online MBA programme was more salient among elder learners.

5.1.1 Learner

The study has shown that 'learner characteristics' has strongest impact on the intention to enrol an online MBA programme. This is in line with the research conducted by Poon et al. (2004), Folorunso et al. (2006), Selim (2005) and Volery and Lord (2000) which claimed that students' characteristics could influence acceptance of e-learning among students. Two constructs under this variable, i.e., intrinsic motivation and computer self-efficacy, were found to be positively significant in association with the intention to enrol an online programme. This indicates that as the intrinsic motivation and computer self-efficacy of the learner increase, the intention of the learner to sign up an online programme will also increase. These results are consistent with much of the researches investigating the intention of usage and acceptance of technology in various contexts. For example, in the MM, it is shown that intrinsic motivation has a direct effect on intention (Davis et al., 1992) and Brown (2001) reported that self-efficacy as the variable having greatest influence for students accepting web-based learning tools. The effect of computer self-efficacy is also similar to a survey conducted by Lim (2001) which reported that computer self-efficacy was an important factor in adult learners' intent to take future web-based courses.

5.1.2 Institution

According to Wagner and Yousefifard (2009), cost of education, physical aspect and facilities of higher education institution (HEI), institutional information had significant relationships with a student's intention to study at an HEI. In this study, it was found that 'institution characteristics' has no significant influence to the intention to take up an online programme. This finding is not in line with the findings in a study of Wagner and Yousefifard (2009). The inconsistency most probably is due to the scope of the study and the description of 'institution characteristics'. This study focus on an institute that offered an online graduate programme whereas the latter focused on students intended to take an undergraduate programme at an HEI. Besides, the constructs used to describe the variable 'institution characteristics' differ and ultimately lead to different measuring scales. Facilitating conditions (adapted from UTAUT), reputation (as defined by Gray et al., 2003) and financial supports were used to describe the institution characteristics in this study while cost of education, physical aspect and facilities of HEI and institutional information were described as the institutional factors in Wagner and Yousefifard's (2009) study.

5.1.3 Technology

Technology has become the most powerful tool in almost every aspect of human's daily life and it is regarded as a major revolution that has a significant impact on education (Tang et al., 2009). According to Poon et al. (2004) and Rafaeli and Sudweeks (1997), technology support and system were key determinants in the acceptance of e-learning. To

create e-learning acceptance, the technology and the e-learning system must be well maintained and up-to-date (Folorunso et al., 2006; Poon et al., 2004; Selim, 2005). The study's results indicated that 'technology characteristics' was a positive determinant to the intention to enrol an online programme. Past literature conducted by Folorunso et al. (2006), Poon et al. (2004) and Selim (2005) also found the importance of the technology to the acceptance of e-learning.

In this study, technology characteristics were defined as infrastructure of the technology and technology acceptance. Technology acceptance was a new label assigned after the factor analysis since it was the combination of two core constructs from TAM, i.e., perceived usefulness and ease of use of the technology. Following the acceptance of hypotheses H3 (technology characteristics have significant impact on the intention to enrol an online MBA programme), further evaluation on its two constructs, namely infrastructure and technology acceptance, against the DV was carried out. It was observed that the technology acceptance has positive relationship with the intention. Likewise, this finding is consistent with most of the prior research on the TAM model (Davis, 1989; Venkatesh, 2000; Mathieson, 1991; Taylor and Todd, 1995; Wu et al., 2008).

Conversely, another construct defined in technology, i.e., infrastructure, was found non-significant to the intention to enrol an online programme. This contradicts with the previous research by Folorunso et al. (2006), Poon et al. (2004)and Selim (2005) which claimed that the infrastructure of technology and technical support of e-learning system were among other factors contributing to the acceptance of e-learning. Nevertheless, Venkatesh et al. (2003) quoted that it has been demonstrated that issues related to the support infrastructure are largely captured with the effort expectancy constructs which taps the ease with which that tool can be applied (for example, a survey by Venkatesh et al., 2000). This means if the effort expectancy (which relates to the ease of use of a tool) is not present in the model, then issues related to the support infrastructure is significant. Otherwise, it is not significant in predicting the intention. In this study, both infrastructure and ease of use were the core components in 'technology characteristics'. It, therefore, was believed that the effect of infrastructure could be captured by the other construct, ease of use and ultimately it became a non-significant predictor of intention in this study. This finding is consistent with these arguments.

5.1.4 Perceived risks

Several literatures studying the perceived risk and the adoption of certain technology have shown significant negative relationship, for example, relationship between perceived risk and attitude (Liu and Wei, 2003); and relationship perceived risk and perceived usefulness (Lee et al., 2001; Lee and Ho, 2002; Ramayah et al., 2005). Mohamed and Hassan's (2008) study was among limited literatures studying the impact of perceived risk relevant to online education context. Their study indicated that perceived risks in online education is very important and had revealed that various dimensions of perceived risks for online education, namely performance risk, time-loss risk, psychological risk and source risk were strong negative predictive of online enrolment.

In this study, it was shown that perceived risk was a significant determinant to the intention to enrol an online MBA programme. It has a negative relationship with the intention, i.e., when the risks perceived by the learner increase, the intention to sign up an

online programme will decrease. This was in line with Mohamed and Hassan's (2008) study. Further analysis on the constructs of the perceived risks revealed that social risk was among the two constructs of perceived risks that proved to be negatively related to the intention to enrol an online graduate programme. This was not in line with the findings by Mohamed and Hassan (2008) that reported social risk was not a predictive of online education enrolment. The inconsistency was probably due to different pool of respondents in these two studies. The respondents in this study were adults who have obtained at least a bachelor's degree, while 75% of the respondents in Mohamed and Hassan's (2008) study were undergraduate students in a university. The former are savvy group to make their own decision to take up any online programme, whereas the latter are undergraduate students who were not independent in decision-making and mostly the decision to take up any course was made or affected by their parents. As defined, social risk involves ways of others think of the online education learners and therefore the feelings of the undergraduate students whether or not other's opinions of their enrolment in the online programme were not of their concern.

The other construct in perceived risk, namely source risk was found not significant to the intention. This finding again was not sync with the finding by Mohamed and Hassan (2008). According to the definition by Mohamed and Hassan (2008), source risk was concern over the credibility of the university offering the online education course.

5.1.5 *Moderating effect of demographics variables – age and gender*

Gender and age differences have been shown to exist in technology adoption contexts (Morris and Venkatesh, 2000). As claimed by many researchers (Venkatesh et al., 2003; Marchewka et al., 2007), age and gender have been recognised to play an important moderating role in IT or IS acceptance research. In this study, age was found to have significant moderating effect on risks in association to the intention to enrol an online MBA programme and the effect would be stronger for older learners. It seems that younger people are more passionate about the new technology and are more willing to take risks. Hence, the results was in line with the UTAUT study by Venkatesh et al. (2003) which suggested that the age effects greater for older workers and a stronger willingness for younger workers to adopt new IT products.

Similar to age, gender is theorised to play a moderating role in IT context (Venkatesh et al., 2003). UTAUT study by Venkatesh et al. (2003) revealed that the relationship between perceived usefulness, ease of use, and intention to use can be moderated by age, gender and experience, e.g., the strength between perceived usefulness and intention to use is more significant for male and younger workers, the effect of perceived ease of use on intention is more significant for female and older workers and those effects decrease with experiences. However, in this study, gender did not appear to have a significant moderating effect on the relationship between the four variables, namely learner characteristics, institution characteristics, technology characteristics and perceived risks, and the intention to enrol an online programme. The absence of gender differences in this study can be due to the pools of samples which comprising of males and females who have received similar educational level (i.e., at least a bachelor's degree) and similar exposure to technology. Hence, it may not be surprising that gender did not demonstrate a moderating effect to the intention in this study.

6 Conclusions

6.1 Implications of the study

Several conclusions had been drawn from this study. These are vital for institutions that attempting to incorporate online education concept in their education mode to design and execute better strategies for higher uptake of their online graduate programme. Besides, the implication of the study could be discussed from Penang's government perspective. Understanding the key determinants for the intention to online programme enrolment had shed light to the state government ways to maintain Penang's competitiveness within the higher education sector while strengthen its position as the hub for higher education. The findings of this study have indicated that learner characteristics, technology and risks that learners perceived were significant factors influencing the intention to enrol an online programme. Further analysis on these group factors revealed that intrinsic motivation, self-efficacy, perceived of usefulness, ease of use and social risk were significant predictor for the intention. Intrinsic motivation was an important determinant influencing the intention to enrol an online graduate programme. In this study, intrinsic motivation was measured in terms of enjoyment representing a reward apart from any performance consequences that may be anticipated (Davis et al., 1992). Hence, it is essential for online education provider to develop and deliver online courses that are more fun. Courses can be fun when they encourage a learner to be active and this can be done by incorporating meaningful peer interaction into the online course, for example adding experimental storytelling could be a great way to spark more active participation among learners.

Computer self-efficacy, perceived usefulness and ease of use were found to be significant determinant to the intention to enrol an online programme. Marketing briefing, talks and workshops in regards to the online MBA programme could be organised to allow the potential learner to further understand and familiarise with the online portal to be used. The technical capability of the computer network is also one aspect of the preparation. Social risk was also indicated as a significant negative predictor to the intention. If this risk level can be reduced, the intention of the online programme enrolment will, therefore, increase. The findings in regards to the moderating effect of age to the risks had further shed light to the providers the needs of different age groups. It revealed that high age groups are not a risk taker comparing to younger-age group. Hence, it is important for the online education provider to share the accreditation body of their programme to public, especially to older-age group persons.

From the government's perspective, in the effort to eliminate or minimise the social risk perceived by the online learners, the government should seriously look into every opportunity to promote the online education and to consider the transformation of current education system into the e-mode or online mode. These online education initiatives could help to enhance the awareness of the future education trend and indirectly increase the confidence level of the quality of online education in Malaysia. As suggested by the committee (the committed to study, review and make recommendations concerning the development and direction of higher education in Malaysia) in the Ministry of Higher Education's (MOHE) report in year 2006, e-learning content development by experts to be significantly increased, incentive-based rewards be drawn up and implemented to promote interests in e-learning contents development for public universities, polytechnics and community colleges. Besides, the recommendation that the committee proposed to give sponsorship to students who embark on distance-learning programmes should be

extended to online education programme as well. It was also recommended that special funding mechanism to be instituted to encourage online programme enrolment. With all the efforts and initiatives done by the government, the perception of the online education will be able to change and consequently, the social risk will be reduced and the number of online learners will be increased.

6.2 Limitations

Despite the implications of the study, there are several limitations need to be acknowledged for future research. One limitation concerns the scales used to measure the main IVs, namely learner, institution, technology and perceived risks. Each of these variables was operationalised by using the technique of highest-loading items from each of the respective scales, as recommended by Nunnally and Bernstein (1994). However, one danger of this approach is the constructs contained in the respective variable can be eliminated. For example, it was observed that attitude which was adapted from TRA model was not represented in 'learner characteristics' after factor analysis. Obviously, choosing the highest-loading items has result in items from some of the models not being represented in some of the variables and thus, it threatens the content validity. Therefore, the measures that were identified in this study should be viewed as preliminary and taken as guideline for future research where more appropriate scales should be developed and validated. Second, limitation was the study has been conducted using data from Penang state and hence, the findings cannot be generalised extensively to the whole country. Another limitation was the convenience sampling method. This sampling approach has result in majority of the respondents (about 63%) from manufacturing or engineering. Due to their non-business background, they may not able to fully and truly in expressing their feelings and opinions on the intention to enrol an online management programme. Consequently, it may affect the representation of the population and cause the findings cannot be generalised to a broader population.

6.3 Conclusions

The findings of this study revealed that learner characteristics, technology characteristics and perceived risks are determinants of the intention to enrol an online graduate programme. Among the constructs of each determinant is intrinsic motivation, computer self-efficacy, facilitating conditions, reputations, financial supports, technology acceptance, technology acceptance as well as social risk and source risk. In conjunction with the Malaysian government's effort to increase higher education enrolment as well as building the world-class human capital as highlighted in 9MP, there has been considerable growth with the number of Malaysian virtual campuses in the last couple years. Hence, the findings of this study may serve as foundation and guideline for these online programme providers to develop strategies that could help to increase the online graduate programme enrolment. By understanding the key determinants and the strongest predictor of the intention to enrol an online graduate programme as well as the moderating effects to the relationship model, priorities and appropriate action plans can be set by the online programme providers with the ultimate goal to increase the enrolment of the online programme.

Notwithstanding the limitation of the sampling approach as stated earlier, indirectly, this study contributes towards a better understanding and positive perception of the online

MBA programme. It assists in promoting and creating the awareness of its online MBA programme through the distribution of the brochure to the respondents during the survey, with the aim of improving the familiarity of the respondents with the programme. While the findings of this study could assist higher institutions in Malaysia in improving the quality of online MBA programme and their learning experiences, it is hoped that transforming the limitations of this study into opportunities and challenges could help to spur further research in the area of online programme enrolment.

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