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ABSTRACT

Despite the heavy promotion by the local government, the plentiful provision of IT educational tools, and the sufficient IT skills of prospective users, the adoption of IT in classroom education by primary and secondary school teachers in Hong Kong is still minor. By focusing on the use of IT educational Websites, which are freely available for teachers, this paper attempts to investigate the factors that influence the adoption of e-teaching in classrooms among primary and secondary school teachers in Hong Kong. With reference to the paradigms of information technology, cognitive thinking and organizational learning, a research model, together with a preliminary outline of the operationalization of the measures and data collection method for model testing, are presented in this paper. It is believed that the findings of the study proposed here could contribute to a more in-depth understanding on the adoption of IT tools by teachers, which is crucial for software developers to excel in this potentially enormous industry.

Keywords: e-teaching, primary and secondary education, IT adoption, educational Website

1. INTRODUCTION

The use of Information Technology (IT) in primary and secondary education has recently been receiving much attention in Asia, primarily due to the boom in using the Internet in the region as well as the potential in exploiting this medium to enhance interactive communication and collaborative learning (Kumar, 1996; Wong, 2000). In Hong Kong, there are various educational parties or software developers providing IT educational tools (e.g., animated movies and interactive games) for primary and secondary school teachers free of charge, with dedication to host them through the Internet for easy and extensive access (Table 1). Conceivably, the propagation of those materials could enable teachers to leverage multiple ways of classroom communication, information sharing, and learning effectiveness (Puntambekar et al., 1997; Wong, 2000). However the usage of IT (specifically adopted as a mean for effective teaching) has not received as much interests and enthusiasm from teachers as expected.

In regard to the evolving growth of e-based education, we consider that a systemic inquiry of the disparity between the devoted propagation and actual adoption is crucial. Specifically, as teachers are the initiators of classroom e-education, this paper investigates the factors that influence the adoption of e-teaching among primary and secondary school teachers in Hong Kong. Section 2 describes the recent trends in IT development and usage in the educational sector of Hong Kong, which give rise to the motivation of a study proposed in this paper. Section 3 presents the highlights of e-teaching as well as e-learning in previous studies. Section 4 depicts a research model together with a preliminary outline of the operationalization of the measures and data collection method for model testing. Section 5 proposes the agenda for the study. Finally, a conclusion is given in Section 6.

Table 1. IT Educational Tools' Developers and Educational Websites

IT educational tools developer	Examples of IT educational Website
Statutory body e.g. The Educational and Manpower Bureau http://www.emb.gov.hk	http://resources.ed.gov.hk/funcomputer/
Non-profit making educational organizations e.g. HKEdcity http://www.hkedcity.net	http://ihouse.hkedcity.net/~ma3711/
Commercial Organizations e.g. Textbook publishers	http://www.timeskids.com.hk (Movie and game section)
Primary and secondary school teachers	http://hk.geocities.com/math1addminus/a1.htm

2. EDUCATION AND IT IN HONG KONG

As mentioned above, it is mused that e-teaching is active in Hong Kong. The majority of the education tools are offered for use free of charge, and the government's 5-year strategy on IT in education launched in 1998 has substantially devoted financial resources, manpower and infrastructures in promoting the use of IT in primary and secondary education. Despite the availability of favorable condition of e-teaching, it is found that there are unmet promises and thwarted performance in regard to the low usage and slow diffusion. As of year 2000, about half of the primary and secondary school teachers still spent less than 5% of their teaching time in using IT (Education and Manpower Bureau, 2001). Besides, those adopted IT in their teaching tended to use primitive yet ineffective tools, which could hardly facilitate two-way communication or enhance learning effectiveness.

At present, little has been known about the reasons of the relatively low adoption rate of IT tools in classroom settings. As teachers are the initiators and reference stance of IT adoption in classroom learning, our study focus on the examination of the genuine factors that facilitate or inhibit e-teaching adoption in primary and secondary schools in Hong Kong. We ultimately identified studies related to IT adoption, learning, knowledge management and cognitive thinking are insightful and useful as the research paradigms for the proposed model.

3. E-TEACHING AND E-LEARNING

Educational reports seem supporting that time is a crucial factor to affect teachers' e-teaching behavior. For those teachers adopted electronic means in teaching mused that they have to spend a lot of time in taking up the technology, prior to the integrative use of with teaching content. Other teachers dropped out from e-teaching asserted that their time for e-teaching were distracted with the increasing load in other school work. Other non-adopters claimed that they may not draw much benefits from e-teaching. Other inhibiting factors include: lack of management support and oversight, lack of motivation to transit from traditional classroom teaching to e-teaching, incapable to cope with technology, lack of measurement on teaching effectiveness from adopting e-teaching.

Despite these hindrance, the benefits of adopting IT tools in learning has been ascertained. There have been studies that address the significance for e-learning in enhancing the organizational performance (e.g., Benbunan-Fich 2002, Frankola 2001, Honey 2001), types of learning (Jansen et al. 2002, Lytras et al. 2003, Taylor 2002) or success factors (e.g., Hiltz and Turoff 2002, Kerrin and Winfield 2001). Yet, only a few of them recognize learning as a process that transited from conventional face-to-face mode (teacher as dominant player) to e-teaching (teacher in complement with technology) and e-learning (students as dominant player) (Crocetti 2002). Given the infant stage of technology deployment in the educational sector of Hong Kong, this study aims to examine the behaviors of teachers who are primary user groups, as such we can capitalize the values of technology in classrooms (e-teaching) and propagate to students for well-rounded learning process (e-learning).

4. PROPOSED MODEL

The innovative way for learning with IT as the medium of teaching encompasses a complex blend of socio-technological factors that influence the usage the technologies involved. A review of prior literature and empirical studies in regard to the paradigms of information technology, cognitive thinking and organizational learning was conducted. Several key notions were emerged that enable us to devise a proposed model for further study. It was found that the Technology Acceptance Model (TAM) (Davis 1989) is seminal as a starting point to investigate plausible elements that affect (either as enablers or inhibitors) the teachers to adopt IT in their teaching practice. In view of the intricate nature of individuals and their intersubjective interpretations towards the complex environment (Kettanurak et al. 2001), it is suggested that cognitive aspect is recognized as the precondition to govern one's behaviors and actions. In particular, the cognitive styles or personal traits have been attended and researched to explain the desirable outcomes undertaken by human (Akbar 2003, Choi and Lee 2003), which implies the relevance in the current studies. Exploring the learning cycle and knowledge management, it is deemed that the effective use of technology by teachers can be collated with the degree of diffusion of innovation (Rogers, 1995). More subtly, the diffusion can be extended with the depth and breadth of diffusion (Malhotra and Galletta 1999).

The proposed model is presented (Figure 1). The perceived usefulness and perceived ease of use are independent variables that affect the actual use (including infusion and diffusion encompassed within dotted line). The technology usage is mediated by the attitude presented by the users. Between the independent variables and mediating factors, it is proposed that the human traits as innovativeness, and the environmental context as social influence are moderators that influence the associations.

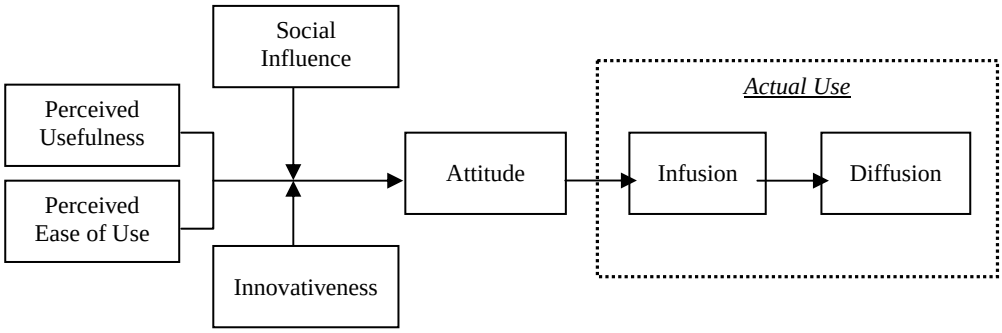

Figure 1. Proposed Model of E-Teaching in Hong Kong Education

Table 2. Operationalization of Measures – an Example

Constructs	Sample Measures in E-Teaching Context *	Reference
Perceived Usefulness Defined as the user's (i.e. teacher in this study) subjective belief that using a specific application system will increase his job performance.	Using X in my teaching would enable me to accomplish tasks more quickly.	Davis (1989) Chau and Hu (2001)
Perceived Ease of Use Defined as the extent of user expects that using a target system to be free of effort.	Learning to operate X would be easy for me.	Davis 1989 (Chau and Hu 2001)
Social Influence Defined as the extent of user's affection change or commitment to technology due to external force, for example peer group pressure or government mandates.	Colleagues in my school think we should avoid to use X. Government believes teachers should be enthusiastic to use X.	Malhotra and Galletta (1999) Lewis et al. (2003)
Innovativeness Defined as the degree user's inclination/personal traits towards doing things better (adaptive) or doing things differently (innovative).	Readily agrees with the team at work (Adaptor). Prefers changes to occur gradually (Innovator).	Kirton (1976) Garfield et al. (2001)
Attitude Defined as the user's desirability of his use of system.	Using X in my teaching is a good idea.	Taylor and Todd (1995)
Infusion Defined as the user's state in making use of a target system in a full and complete manner.	I have a thorough knowledge using X in my teaching. I can integrate the target system X in different teaching subjects.	Kishore and McLean (1998) Carter et al. (1999)
Diffusion Defined as the user's state in persuading other in the use of a target system.	I recommend X to my colleagues for effective teaching. I am committed to let my colleagues to explore the potency of X in teaching.	Kishore and McLean (1998) Carter et al. (1999) Lewis and Orton (2000)

*** X** – denotes as a selected educational website

As illustrated in Figure 1, there are seven constructs entailed. The description of each construct is detailed in Table 2, with their examples of measurement item and reference source.

5. RESEARCH AGENDA

Understanding the technology adoption in Hong Kong education is significant to the policy makers and educators as it directs the ways to advance knowledge and competences of students, and competitiveness of people in the long run. Also, an understanding of the factors that affect the adoption and diffusion of IT educational tools among teachers enables software developers to develop and promote their educational products in an effective and efficient manner. Therefore, the exploratory study needs further synthesis and empirical validation. A seven-stage of research task is planned.

1. Adopt validated instrument/ measurement items (Table 2)
   - Undertake minor wording changes to tailor them to the target context of education

2. Conducted Focus Group study to solicit qualitative data and opinion
- Expose other unattended attributes of each construct

3. Synthesize and frame up results from stage (2)
- Augment to the measure items in stage (1) and prepare initial questionnaire for pretest

4. Pretest with a sample of 50 teachers on their E-teaching behaviors
- Include both adopters and non-adopters in the subject sample

5. Assess data for statistical generalization and refine the items
- Base upon the validation on reliability and validity
- Prepare the questionnaire for main survey

6. Collect data from the schools with IT adoption and without IT adoption in teaching
- Seek help from government offices to institutionalize the survey

7. Compare results and generalize the features in each group
- Draw implications on enhancement program on IT usage, for example culture, training and development and system design

6. CONCLUSION

The study proposed in this paper aims to explicate the underlying reasons for the (in)effective e-education phenomena in Hong Kong, specifically e-teaching. It is expected that the systemic approach of examination can shed lights on the entities for primary and secondary education, such as the government, management and teachers, in order to evaluate their planned initiatives, existing practices and possible remedies.

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