



Examining technology acceptance by school teachers: a longitudinal study

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Abstract

The role of information technology (IT) in education has significantly increased, but resistance to technology by public school teachers worldwide remains high. This study examined public school teachers' technology acceptance decision-making by using a research model that is based on key findings from relevant prior research and important characteristics of the targeted user acceptance phenomenon. The model was longitudinally tested using responses from more than 130 teachers attending an intensive 4-week training program on Microsoft PowerPoint™, a common but important classroom presentation technology. In addition to identifying key acceptance determinants, we examined plausible changes in acceptance drivers over the course of the training, including their influence patterns and magnitudes. Overall, our model showed a reasonably good fit with the data and exhibited satisfactory explanatory power, based on the responses collected from training commencement and completion. Our findings suggest a highly prominent and significant core influence path from job relevance to perceived usefulness and then technology acceptance. Analysis of data collected at the beginning and the end of the training supports most of our hypotheses and sheds light on plausible changes in their influences over time. Specifically, teachers appear to consider a rich set of factors in initial acceptance but concentrate on fundamental determinants (e.g. perceived usefulness and perceived ease of use) in their continued acceptance.

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1. Introduction

The role of information technology (IT) in modern education has increased significantly over the past two decades, but resistance to technology remains considerably high [25]. While technology-supported teaching/learning has become increasingly important

in education [6,28,36,43], fostering technology acceptance (as defined by Gattiker [24]) among individual educators remains a critical challenge for school administrators, technology advocates, and concerned government agencies. Understandably, pervasive technology acceptance by school teachers is required for realizing the technology-empowered teaching/learning paradigm advocated by visionary educators and IT professionals. As Keen [23] commented, "it is not the software but the human side of the implementation

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cycle that will block progress in seeing that the delivered systems are used effectively.”

Fundamental to teaching activities is the preparation and presentation of the materials that are selected and packaged to disseminate knowledge. Towards this end, use of an adequate technology can enable teachers to become increasingly effective in preparing, presenting, describing and transferring knowledge, thus nourishing, inspiring, and advancing students’ developments. Morrison and Vogel [47] have therefore advocated effective use of technology-supported presentation visuals to enhance students’ comprehension and retention of course materials.

As a group, teachers may subtly differ from end-users in ordinary business settings. For instance, teachers are relatively independent and have considerable autonomy over their teaching activities, including technology choice and use. This suggests a professional orientation [2] that might lead to differences in teachers’ technology acceptance compared to that of business users. Public schools are institutions whose objectives fundamentally differ from those of business organizations: teachers usually have less peer competition for resources or promotion. From a research perspective, such characteristics can affect teachers’ technology acceptance which, as a result, may differ from that of business workers examined in most previous research.

Teachers have lasting impact on students’ intellectual developments, value systems, and attitudinal beliefs, including those concerning technology. Also public school teachers are not particularly technology-savvy, partially because the older ones received training when technology was less developed and pervasive. This, together with a demanding workload and stringent time constraints, can severely hinder technology acceptance by individual teachers, which may have been partially responsible for the lack of convincing evidence supporting technology’s impacts on learning in K-12 education [27].

Our research longitudinally examined technology acceptance decisions by public school teachers. In addition to identifying key acceptance drivers, we examined how their decision-making may differ from that of business end-users. Specifically, we developed a model for explaining teachers’ technology acceptance decision-making, taking into account findings from relevant prior research and important

characteristics of the targeted education context. We tested this model using the responses from more than 130 teachers in Hong Kong. The particular technology examined was Microsoft PowerPoint™, which can greatly facilitate teachers’ organizing, archiving, presenting, updating and sharing class materials [7].

2. Study background

To prepare students for challenges in a knowledge-centric economy, school administrators and government leaders in Hong Kong have strongly emphasized proper integration of technology into curriculum design and classroom activities [1]. Accordingly, technology deployment in education has accelerated, fuelled by substantially increased incentives and funding. For instance, US\$ 335 million in capital investments and US\$ 30 million in annually recurring costs were earmarked for promoting the use of technology in education in 1998–1999. At the time of our study, most public schools were equipped with networked computers and Internet access.

The critical role of IT in education is clearly recognized by the Education Department, which identified technology-enhanced teaching/learning to be an important objective in its education strategy between 1998 and 2003. Individual teachers’ attitudes toward technology and their ability to use and integrate applications in routine classroom activities were specifically targeted in “Information Technology Learning Targets” in 2000. Several technology competency levels were defined for measuring teachers’ capability to use technology and providing a foundation for training program design.

At the time of our investigation, use of PowerPoint by teachers was far from widespread. From a technology management perspective, examining teachers’ acceptance at this particular time was important; e.g. highlighting barriers to individual acceptance and, at the same time, shedding light on adequate management intervention. In cooperation with the Hong Kong Professional Teachers’ Union, the largest teachers’ union in the region, we conducted a longitudinal study to examine individual teachers’ technology acceptance decision-making before and after an intensive training program.

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