A Cross-Cultural Validation of the Selwyn’s Computer Attitude Scale (CAS)

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ABSTRACT

This study assesses the factorial validity of the Computer Attitude Scale (CAS) using a sample (N=438) of students from Singapore. Developed by Selwyn (1997), the CAS is a four-factor scale that measures the perceived usefulness, affective, behavioral, perceived control components that were proposed to constitute the multidimensional construct known as computer attitude. The results of this study show an overall positive computer attitude among the students. However, factor analyses reveal multicollinearity among some items and these were removed from further analysis. A confirmatory factor analysis was performed on a proposed 15-item model of the CAS and it was found to have a good fit. Implications for education in the Asian contexts are discussed. Suggestions for future research are offered.

Keyword: CAS, Computer Attitudes Scale (CAS), Confirmatory Factor Analysis, Scale Validation, Singapore

1. INTRODUCTION

Technology has become an integral part of teaching and learning. With increased usage of instructional technology, web-based instructional resources like the electronic textbooks are slowly making their way into the higher education system. Given its increased use, it is important to understand the influence that computers has on students’ attitudes toward learning. An important aspect in the successful implementation of technology in teaching and learning is user acceptance, which is influenced by users’ attitude towards computers (Teo, 2008). Various studies have addressed the issue of students’ attitude toward instructional technology and specifically toward computer technology and technologically-enriched learning environments (Drennan, Kennedy, & Pisarzski, 2005; Hahne, Benndorf, Frey, & Herzig, 2005). For this reason, students’ attitudes toward computers have been studied with different samples and instruments by many researchers since the 1980s. Attitude has been found to be a predictor of the adoption of new technologies by users at various levels, such as young students (Teo & Noyes, 2008), post-secondary school students (Teo, 2006), and pre-service teachers (Teo, Lee, & Chai, 2008).

Over the last few years a considerable body of literature has been written to explain...
the numerous variables found to have an influence on computer attitudes. These included computer anxiety, computer stress, perceptions of computers, and computer proficiency (Crable, Brodzinski, & Scherer, 1991; Gardner, Discenza, & Dukes, 1993; Hudiburg, Brown, & Jones, 1993; Igbaria & Chakrabarti, 1990; Kay, 1993; Loyd & Gressard, 1984; Maurer, 1994; Nickell & Pinto, 1986; Pope-Davis & Twing, 1991; Teo & Noyes, 2008; Woodrow, 1991). This broad array of research is multi-disciplinary and incorporates a wide variety of perspectives and topics. However, at its foundation, the above research was directed at examining the effect of attitude in influencing a person’s ability to use a computer efficiently.

The attitudes and feelings involved with computers are difficult to identify. As the role of the computer expands and increases in our education system, it is crucial that educators are aware of how attitudes toward computers affect the way our students learn with computers. Recent years, researchers have found close relationships between computer attitudes and other variables. Of these, the most crucial is the positive relationship between computer attitudes and computer usage. No matter how sophisticated and powerful the state of technology is, the extent to which it is implemented depends on users having a positive attitude toward it (Huang & Liaw, 2005). This is consistent with Teo (2006) who suggested that negative attitudes toward computers may exist, and could be a deterrent to using computers in the learning environment. When students respond positively to computers, they tend to master the necessary skills quickly. Conversely, for students who find the using the computer to be an unpleasant and anxious experience, mastering the appropriate skills could prove to be difficult. This anxiety may take the form of hostility, fear, and/or resistance; these are attitudes, which may inhibit the acquisition of computer skills much as mathematics anxiety can inhibit achievement in this subject (Yildirim, 2000). It appears that, students’ attitudes towards and acceptance of computer technology, as well as learning about computers, may be important in the integration of electronic technologies in the classroom, workplace, and home.

Research has suggested that computer attitudes play an influential role in determining the extent to which students use the computer as a learning tool (Teo, 2006) and future behaviors towards the computer such as using it for further study and vocational purposes (Huang & Liaw, 2005). Among others, Sankaran, Sankaran, and Bui (2000) found a positive correlation between a student’s attitudes toward course format and his or her performance in the course. Specifically, it was found that students who favored web-based courses had performed better than those students who had completed the course through the lecture format. This was corroborated by Pan, Sivo, and Brophy (2003) who found that, among other variables such as subjective norm, computer self-efficacy, and perceived usefulness, attitude toward WebCT was the only variable that was significant in predicting the students’ final grade. On the influence of attitude on future behaviors, Sanders and Morrison-Shetlar (2001) found that, among other variables, attitude towards web-based materials play a significant role in influencing the future use of the web management system (e.g., WebCT).

### 1.1 Measuring Computer Attitudes

From much of the published research, Likert-type attitude scales have been developed and validated to measure computer attitudes. For example, the Loyd and Gressard’s (1984) Computer Attitude Scale (CAS) is the most extensively used scale with three affective dimensions: computer anxiety, computer confidence, and computer liking. At a later stage, Loyd and Loyd (1985) added a fourth dimension, computer usefulness to the CAS. Nash and Moroz (1997) combined computer confidence and computer anxiety subscales and formed one computer confidence/anxiety subscale, then added one more factor, academic endeavours, which was associated with computer training. In the end, the CAS became a 34-item scale covering computer liking, computer useful-

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