

ASPECTS OF SELF-PERCEIVED COMPUTER COMPETENCE AND ITS PREDICTORS AMONG UNIVERSITY STUDENTS

Johan van Braak¹ & Katie Goeman²

ABSTRACT

In this paper two instruments of self-perceived computer competence are developed: 'variety of computer applications used' and 'in-depth knowledge of operating systems, word processing programs and Internet'. Two hundred and eleven undergraduate students in the social sciences responded to a self-report questionnaire. Results indicate a very high correlation between both computer competence scales. Path analysis demonstrate that 'in depth knowledge of computer applications' is dependent upon five factors: computer attitudes, computer experience expressed in time, intensity of computer use, home access to a computer and gender.

INTRODUCTION

Students must possess a wide variety of computer knowledge and skills for both academic and career success (Furst-Bowe et al., 1995; Oliver, 2000). Although university freshmen have already completed one or more basic computer courses at secondary school level, university staff are typically confronted with a wide range of computer competence. A second problem is the lack of agreement on the exact level of computer competence students should obtain during their academic study, as well as a disagreement on how this competence should be taught. Several studies reported the influence of cognitive, social, motivational and affective factors on computer competence, including computer ownership, age, computer experience, gender, computer confidence and attitudes (Campbell & Williams, 1990; Corston & Colman, 1996; Rozell & Gardner, 2000).

In this research not only the level of computer competencies among university students will be assessed but also the influencing factors will be identified. The first goal is to describe two instruments of self-perceived computer competence: the 'variety of computer applications used' and 'in-depth knowledge of basic applications'. A second objective is to identify different factors that affect the level of self-perceived computer competence. Path modeling will be used to examine the strongest predictors of the dependent computer competency variable. After the description of the results, implications of the research findings will be discussed.

METHOD

In November/December 2000, a questionnaire was administered to 211 undergraduate social sciences students. Besides socio-demographic information, the survey assessed computer experience (length of time experienced with

¹ Department of Education, Faculty of Psychology and Education, Vrije Universiteit Brussel; e-mail: Johan.van.Braak@vub.ac.be

² Department of Communication Sciences, Faculty of Arts, Vrije Universiteit Brussel; e-mail: Katie.Goeman@vub.ac.be

computing); intensity of computer use (hours/week); computer attitudes; and two computer competence scales: 'diversity of computer applications used' (16 items) and 'in-depth knowledge of basic computer applications' (30 items).

RESULTS

Descriptives

Different scores on the items of the 'Diversity of Computer Applications' instrument are presented in Table 1. Word processors, operating systems and e-mail packages are the most used applications.

Table 1. Diversity of Computer Applications Scale (n=211)

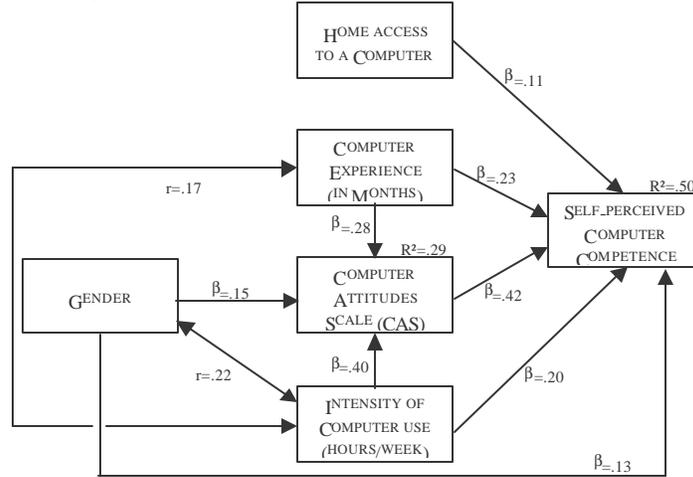
Application	% yes	Application	% yes
Word processing	97.2	Chat programs	51.7
Operating systems	95.3	Graphics	46.0
E-mail	84.8	Databases	44.5
CD-ROMs	71.6	Specific cd-rom/dvd	38.9
(Encyclopedia)		Software	
Spreadsheets	70.6	Presentation Software	28.4
Statistical programs	64.9	Security Software	28.0
Computer Games	60.2	HTML Tools	19.9
Web browser	59.7	Telnet/FTP	14.2

Scores on the 16 items are synthesized in a 'Diversity of Computer Applications Scale (DCA-S). The mean score on the DCA-S (ranging from 0-100) is $M = 54.74$ ($SD = 20.39$). The second self-perceived computer competence scale was not concerned with the amount of different applications used but rather with the in-depth knowledge of three important domains of computer applications: operating systems, word processing and Web skills. Within each of the three domains, respondents were asked to indicate their knowledge with ten basic operations. Scores on the 30 items are synthesized in an 'In-depth Knowledge of Basic Computer Applications Scale (IKBCA-S), with a mean score of $M = 68.90$ ($SD = 19.70$) (ranging from 0-100). A relevant finding is the significant relationship between the two computer competencies measures. The intercorrelation between the DCA-S and the IKBCA-S is $r=.76$ ($p<.001$).

Path analysis

In a next step, the determinants of computer competency are explored. To this end, the IKBCA-S was used as the dependent variable. Results from a path model (Model 1) demonstrate IKBCA-S as dependent upon five factors: computer attitudes ($\beta=.42$), computer experience expressed in time ($\beta=.23$), intensity of computer use ($\beta=.20$), gender ($\beta=.13$) and home access to a computer ($\beta=.11$). The explained variance for 'in depth knowledge of computer applications' is 51 %. Three variables attribute to a 29 % explanation of the Computer Attitude Scale: intensity of computer use ($\beta=.28$), computer experience expressed in time ($\beta=.28$) and gender ($\beta=.15$).

Model 1. Determinants of Self-Perceived Computer Competence: a path model ($X^2 = 4.00$, $df = 5$, $p = .54$, $GFI = .99$).



Discussion

The aim of the current study was to identify determinants of self-perceived computer competence. Computer attitudes were found to be the strongest determinant of self-perceived computer competency. Positive attitudes toward computers in turn seemed to be mainly influenced by computer experience and intensity of computer use. The two experience measures were also found to directly impact upon computer competence. The impact of gender, both on attitudes as perceived computer competence cannot be neglected. Although the effect was found to be statistically moderate, male students tend to show more favorable attitudes toward computers as opposed to female students. Males also reported higher rates of computer competence.

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