

ANTECEDENTS OF INTERNET USE AMONG BRAZILIAN INFORMATION SYSTEMS STUDENTS

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ABSTRACT

Data gathered from 336 information systems students of a university located in the city of Rio de Janeiro was used to test the use of microcomputers in teaching Information Technology and the effect of this on the students' level of Internet use. Three motivators were investigated: perceived usefulness, perceived ease of use, and perceived enjoyment in using microcomputers. The results reinforced previous studies that suggested that the three motivators were interrelated. The students in this research considered usefulness of microcomputers the most important motivator. Perceived ease of use was the only motivator with a significant direct effect on students' level of Internet use. The students' sex, whether their job already involved activities related to computer technology, and their dedication to his/her studies were the three demographic variables which had significant direct effects on Internet use as an aid and complement for learning activities.

Keywords: Information technology, human-computer interaction, Internet use, microcomputer usefulness, intrinsic motivation, enjoyment, Brazil.

INTRODUCTION

Information technology has been the subject of numerous studies in Brazil, mainly due to its strategic role within companies. The use of microcomputers to help individuals in their professional activities is one of the most important actions we must undertake in order to use this technology effectively. This study was motivated by the need to understand the behavior of computer information systems undergraduate students with relation to the use of learning resources made available through the Internet. We were looking for guidelines for the development of a support tool, so as to assure the adhesion of the IS students to a new teaching approach within the university. The research proposed the following question as a starting point: *What are the main antecedent variables of Internet use among Brazilian undergraduate IS students when using computerized learning tools?*

This question was answered with the help of a model that would test whether the individual that chooses to follow a professional career in computer information systems would be both interested in and stimulated by computers, enjoying himself while using them. If this supposition were confirmed, the development of the tool would necessarily have to focus on teaching in a fun way, considering the play aspects of technology. In fact, this result would guide the development of the teaching tool. If the hypothesis were not confirmed, the tool that would be developed would have to give preference to the aspects of practicality and efficiency.

In this study, we aim to offer elements for later research on motivation for using computer technology among Brazilian IS students. We focused on three important motivators for using microcomputers, studied in the literature, as perceived by the user: *usefulness* (1, 12, 15), *ease of use* (5, 12), and *enjoyment* (12, 13). We intended to investigate how undergraduate computer information systems students felt about using microcomputers and how the enjoyment of using microcomputers, their ease of use, perceived usefulness, and Internet use were related within the studied student sample.

RESEARCH MODEL

The relations between the variables involved in this research were analyzed using the model shown in Figure 1. In our understanding, there is a natural precedence of intrinsic stimuli over extrinsic stimuli in human behavior, as proposed by the psychoanalytic theory (9, 10, 11). This has led us to place the intrinsic motivational factors, perceived enjoyment and ease of use, as antecedents with relation to perceived usefulness of microcomputers, as proposed by Dias (7).

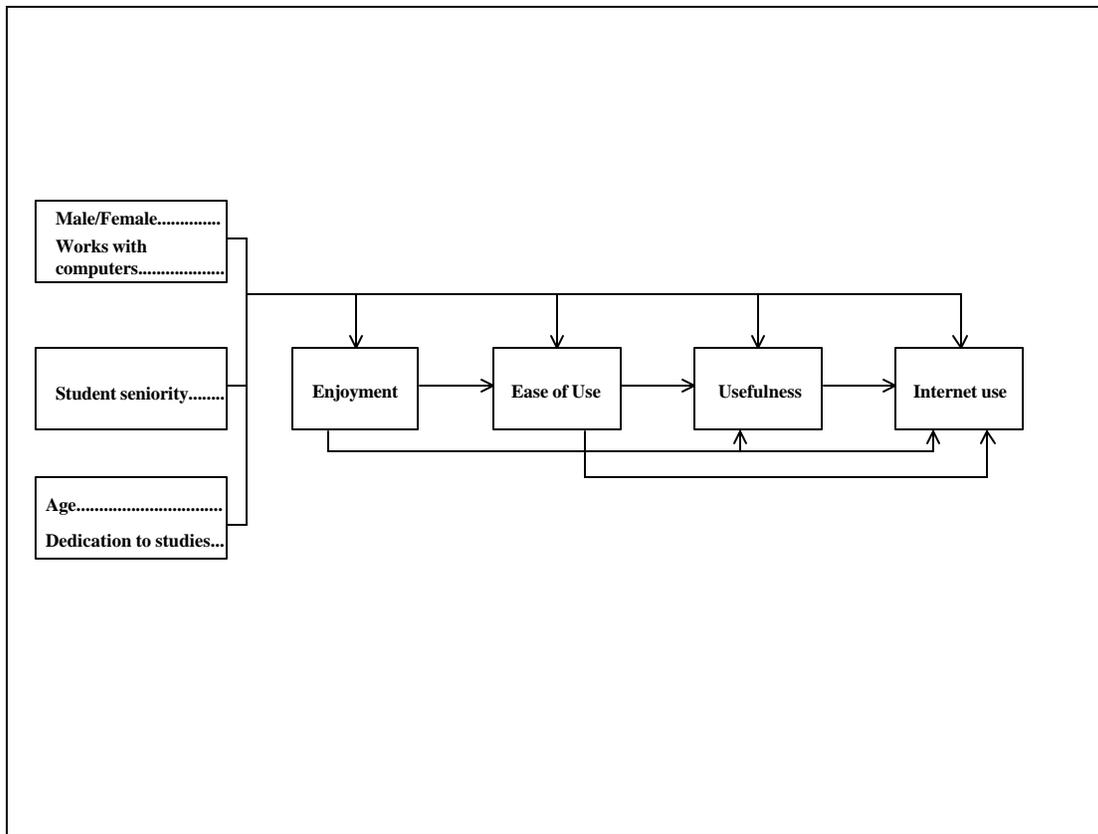


Figure 1 – Research Model

VARIABLES

We used the concept of *perceived usefulness* with regards to the use of microcomputers to mean “the degree to which an individual believes that using a particular system would enhance his or her job performance” (4). Randomly presented statements were used to capture users’ perception of the usefulness of computers. These statements considered the following aspects: quality of the work performed, quickness in accomplishing tasks, improvement in productivity, maximization of use, and

usefulness of computers for the user's work in general. The concept of *ease of use* as perceived by the user when using computers was defined as "the degree to which an individual believes that using a particular system would be free of physical or mental effort" (4). Randomly presented statements were used to capture users' perceived ease of use when using computers, considering: ease of use of the technology itself, ease of use of computers to accomplish tasks, and ease of use to help the user perform his job. We used the concept of *perceived enjoyment* felt by the user when using microcomputers as "the extent to which the activity of using the computer is perceived as being enjoyable in its own right, apart from any performance consequences that may be anticipated" (6). Statements to capture the users' perceived enjoyment when using microcomputers considered the following sensations: excitement, involvement, pleasures in the activity, and fun.

The student's *Internet use* is a self-report measure based on the number of hours a week dedicated to Internet use. The following additional variables were used as antecedent in our model:

1. Student's age
2. Sex – Male/female
3. Working with Information Technology – whether the student currently works in the area of information technology
4. Student seniority – number of disciplines the student has passed
5. Dedication to Studies – number of hours a week the student spends on his or her studies at home

METHODOLOGY

The data for this study was gathered using a questionnaire administered to 336 undergraduate computer information systems students of a university located in the Brazilian State of Rio de Janeiro. Among the students interviewed, 73.8% were male, 75.1% were employed, 58.6% worked in jobs related to the area of information technology, 74.4% were between the ages of 19 and 28, and 43.2% had already been approved in at least 10 disciplines.

In addition to the questions necessary for the participant's profile, the questionnaires contained twelve randomly presented statements related to the three motivational variables studied, using five-point Likert scales ranging from (1) fully disagree to (5) fully agree. The scales used had good internal consistency reliability (Cronbach alpha coefficient), as can be seen in the following results: perceived usefulness, $\alpha = 0.78$; perceived enjoyment, $\alpha = 0.70$; and perceived ease of use, $\alpha = 0.64$.

We used a path analysis model because "the basic aim of any science is to establish causal relations and, as far as a theory is able to show a logical connection between two variables, we may make the intellectual leap to a causal interpretation" (3). We tested our research model using the SPSS procedure Multiple Regression. We took the precaution of checking for multicollinearity between the antecedent variables. The correlation test between antecedent variables did not point to multicollinearity; that is, the correlation coefficients were less than 0.80.

In complex models in which simplifications are adopted, due to effects which one cannot understand or measure as one may have wished, one can't expect high values for the associations between the

variables (2, 8, 14). Based on this experience we considered beta coefficients which were significant and smaller than 0.20 as a signal of the existence of a weak association between variables. On the other hand, a correlation coefficient between 0.20 and 0.40 pointed to a moderate association between variables, and a correlation coefficient higher than 0.40 indicated a strong association between variables.

RESULTS

Qualitative

As far as the general profile of the participants regarding their access to computer technology, all of the students had access to computers at the university, 85.7% had a computer at home, and 90.2% had access to the Internet somewhere other than at the university. Table 1 shows the mean value of the answers for the study’s motivational variables. The results show that the interviewed users felt very motivated by the usefulness of microcomputers (mean = 4.52, s.d. = 0.64). The interviewees, in general, said they found it easy to use computers (mean = 4.28; s.d. = 0.80) and enjoyed using them (mean = 3.86; s.d. = 0.83). The main motivating factors for using computer technology were:

1. *is useful for job* (mean = 4.69; s.d. = 0.72),
2. *increases quality of work* (mean = 4.59; s.d. = 0.82),
3. *improves productivity* (mean = 4.52; s.d. = 0.88), and
4. *helps accomplish tasks more quickly* (mean = 4.42; s.d. = 0.93).

<u>Description</u>	<u>Statement</u>	<u>Mean Variable</u>
<u>Usefulness</u>		4.52
Increase quality of work	4.59	
Accomplish tasks more quickly	4.42	
Improve productivity	4.52	
To use as much as possible	4.39	
Useful for job	4.69	
<u>Ease of use</u>		4.28
Easy to perform tasks	4.45	
Easy to use for work	4.11	
Easy to use	4.28	
<u>Enjoyment</u>		3.86
Exciting	3.31	
No attention to time	3.75	
Fun	4.07	
Pleasant	4.32	

Table 1 – Motivating factors for using microcomputers

Our results confirm what was found in a study conducted among Brazilian managers (7), in a study among professionals and managers of North American companies (13), as well as the results of the

study conducted among professionals and managers of Finnish companies (12). These studies have shown that its users consider the usefulness of computers the most important motivating factor. Users interviewed in the above studies said they use computers mainly because they realize that they are useful tools for improving their job performance and, secondly, because they find them pleasant to use.

Model

The results obtained by testing the model proposed by this study can be seen in Figure 2. *Perceived enjoyment, ease of use, and usefulness* of using computers are factors that are strongly and positively interrelated, confirming previous studies (7).

The dependent variable *Internet use*, which measures the level of Internet use by the students, is directly influenced, as can be seen in Figure 2, by:

- *Sex* (male students use the Internet more often than female students: beta = -0.25);
- *To have job in area related to information technology* (beta = 0.27);
- *Dedication to studies* (beta = 0.22); and
- *Perceived ease of use of microcomputers* (beta = 0.25).

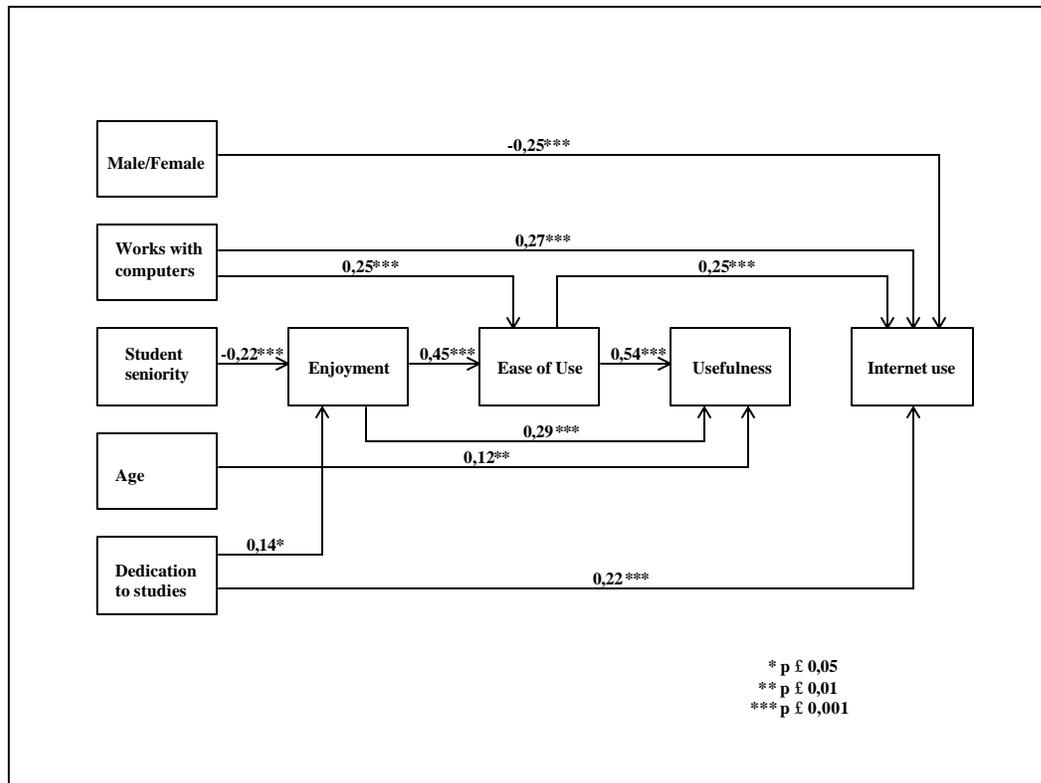


Figure 2 – Results of the model

The fact that a student works in an area related to information technology positively influences his or her perception of how easy it is to use computers (beta = 0.25). It is interesting to point out that, as students progress in their course of study at the university, the play/fun aspects of computer usage seem to

decrease (beta = -0.22). We found weak associations between the following pairs of variables: "Dedication to Studies -> Enjoyment" and "Age -> Usefulness".

CONCLUSION

In a research context as complex as the one undertaken here, it becomes clear that there are other factors which will affect the proposed model, especially if we select a less specific target population. The beta coefficients found for the demographic variables, although very significant, did not prove to be as strong as those obtained between perceived enjoyment, perceived ease of use and perceived usefulness.

The study offers several contributions to the understanding of the factors which influence IS students when it comes to using computers in their learning environment. We confirmed the interrelationship of the three motivators mentioned in the literature: perceived usefulness, perceived ease of use and perceived enjoyment. Students stated that they use computer technology mainly because they thought it increased the quality of their work, helped them accomplish their tasks more quickly, and improved their productivity. The study also showed that it is important that computers be easy to use.

Although students were less unanimous about their enjoyment in using microcomputers, this motivating factor proved its importance. Enjoyment acts as an intrinsic motivator and it became clear that students who enroll in the Computer Information Systems Program do so motivated by a certain attraction to the technology. Play aspects are present in a very clear way. As time goes by, however, computer technology becomes a work tool, and the student starts using the technology motivated by practical factors related to the usefulness of the tool. This conclusion was essential for the development of the university's support tool, which was organized so as to allow students to find information on course content, exercises, and so on, both quickly and effectively

The dependent variable Internet use, which measured how much use the IS students made of the Internet, was influenced directly by the student's sex, whether the student already worked in an area related to computer technology, his/her dedication to studies, and the perceived ease of use in using microcomputers. It is important to notice that male students seemed to make more use of the Internet than female students did in Brazil. The fact of working in an area related to computer technology also influenced, in a positive way, the student's perception of how easy it is to use microcomputers. On the other hand, older students saw more usefulness in using microcomputers, whereas students who were more dedicated to their studies got more enjoyment out of using microcomputers.

We can say that, in our study, the group of participants was relatively homogeneous with relation to level of instruction, geographical region, sex, age and occupation. In future studies, to be conducted among other populations, these and other variables should be utilized in less homogeneous samples.

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