Shared Networks in Technology Education

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INTRODUCTION

Diverse institutions of education have paid special attention to the way they can profit from the use of Web-based shared networks in the last years. The literature review shows us a great interest in defining the variables that can have a direct impact on achieving better final results of a good use of these technologies.

In this chapter, we try to present a view of the main variables that should be taken into account in a global model to measure the general satisfaction of the usage of shared networks in technology education.

BACKGROUND

The effect of the use of shared networks in the final results of the organisations seems to not be easy to find, although it is recognised to exist in most of the literature (Dowling, 1998). Ives and Javenpaa (1991), Mahmood (1997), and Mukhopadhay, Surenda, and Srinivasan (1997) accept the existence of intermediate variables that stress the effect of information and communication technologies towards a better result. In this sense, Wille (1982) and Shneiderman (1992) recognised that formal methodologies are needed in order to guide and support design when implementing information and communication technologies in different contexts. Orliwoski (2000) emphasises the power of people interacting with technology in the organisations as a key element to understand the final satisfaction of information and communication technologies. She affirms that structure, understood as a set of rules and resources internalised in recurrent social practice in relation with the technology, can be a factor of success in IT final results. Powell and Dent Micallef (1997) pay special attention to the role of human and business resources in the IT final satisfaction in firms. All these perspectives have, as a main framework, the resource-based view. From this perspective, organisations must be able to develop capabilities around the technological resources in order to achieve positive results in the use of the information technology per se.

MAIN FOCUS OF THE ARTICLE

In the last decade, a great number of structuralism models have appeared in the applied technology areas. They all have generated a great debate about the role that information and communication technologies play in the organisations (DeSanctis & Poole, 1994; Poole and DeSanctis, 1990; Walsham, 1993). These models consider information and communication technologies as tools that allow more efficient alternatives in the management of the information system. The human action occupies a central place in these models, in particular, the actions that have to do with the use given to these technologies. New approaches that give a special importance, not only to the information and communication technologies in the firm, but to the use that firms make of these technologies and the derived consequences (Roberts & Grabowski, 1995; Weick, 1990) have recently appeared. In this orientation, Orliwoski (2000) from a structuralism perspective on the information technologies' field proposes a practical understanding of the relationship among people, technology, and social action.

By taking into account the theory of reasoned action (Fishbein & Ajzenis, 1975), the attitude reflects the degree of affect that one feels "to or against" any object or behaviour. A person's attitude in relation with the information technology makes a reference about the perception (positive or negative) a person feels about the information technology. Davis (1989) shows that the attitude of people towards the use of the information technologies is directly related to the perception these persons have about the technologies. Orliwoski and Gash (1994) explain how the use that people make of technologies is critical to understand their interaction. Yates and Orliwoski (1992, 1994) speak of genres of organisational communication.

The purpose of communication in a genre is not an individual and private motive for communication but a built purpose recognised by a community and used in some situations. Let us consider from the bibliographical point of view the approaches that in views of the first considered dimension—attitude—are of greater interest in our analysis.

Rhodes and Cox (1990) in an analysis realised in today's practices and policies on how to use computers in primary schools the study of the effects of the student's attitudes through information technologies in the learning process. Fullan (1993) stresses the importance of positively motivating the students in relation to the information technologies to reach a better empathy with them. Russell and Bradley (1997) try to measure the anxiety that people develop towards the computers and the implications they have in the worker's professional career. From their analysis, we can understand that higher degrees of anxiety lead to a decrease in the worker's final results. In the concrete case of the virtual education, Mikropoulos, Chalkidis, Katsikis, and Emvalotis (1998) analyse the attitudes of students towards the modality of virtual learning, by stressing the characteristics that make a student the appropriate customer for the use of Web technologies in this learning style. Collins (1999) emphasises the importance of the training to achieve a positive attitude in the education by using distance means. Shrum and Hong (2002) realise a more complete analysis by introducing the two implied parts: students and lecturers. In their analyses, they stress how to know the characteristics of the students, users of Web technologies, is needed so that the lecturers can develop appropriate strategies for these characteristics. Njagi, Smith, and Isbell (2003) propose a methodology that helps to develop attitudes in the students that enable them a more efficient use of the resources based in the network.

From the resource-based view (Peteraf, 1993), the advantages of developing and maintaining specific intangible assets as the culture, the learning, and the capabilities (Hall, 1993) have tried to be explained. Assets specificity (for example, the abilities developed in a certain moment to operate in a specialised way) can offer the organisations ways towards the search of the competitive advantage (Hansen & Wernerfelt, 1989; Powell, 1996; Rumelt, 1984).

In the relation between information technologies and organisational results, Clemons and Row (1991) developed an analysis showing how the competitive imitation removes a great part of advantages coming from the technology itself. The authors conclude in their analysis that *"although it is possible to find examples of the use of information technologies in order to reach a sustainable competitive advantage; however, they are not as frequent as we think"* (p. 278). Anyway, educational institutions are going to try to reach efficiencies in IT use, and in this sense, they consider that a higher degree of use and the development of routines and procedures in the firm will help to reach IT's objectives. Let us consider now the main approaches from both perspectives—information technologies' use and development of procedures and work routines we consider of major reference for our study.

Visscher (1996) emphasises the importance of the human resource procedures when dealing with information as a key factor in achieving the desired results of IT. Russell and Bradley (1997) analyse how the lack of rules in information technology use in educational centres increases the teacher's computer anxiety and decreases the possibilities of making the best of the information systems. Papandreou and Adamopoulos (1997) compare the way information technology is used in educational centres in two different situations: on one hand, those that have created routines in order to better exploit the technology, and in some others, where IT is a support of free use. Their results show how in the first group of institutions they feel better satisfied with IT in general. Monteith and Smith (2001) illustrate a case showing the pedagogical implications of different students' experiences when following a group of routines recommended in their virtual campus.

Pyburn (1987) pays special attention to the role of a corporate management information system in the success of information technologies in the firms. Lea and Clayton (2001) in a comparative case study observe the direct influence of induced behaviours over Internet technologies in final results in comparison to the organisations that do not induce behaviours. Polke et al. (2002) stress the importance of having a clear university policy in IT use for achieving the desired objectives in technological infrastructure.

The literature on this issue has paid special attention to another factor that can influence in the way of internalising Web technologies in educational institutions. It is maybe a more abstract element and of group consideration that appear in the organisations and that,

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