Organizational Culture in ICT Implementation and Knowledge Management in Spanish and Indian Universities: A Conceptual Model

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ABSTRACT

During the last years environment of Spanish & Indian universities have been changing fast due to the development of new Information and Communications Technology (ICT). Some essential features have been suggested to be implemented to ensure an effective change. An effort has been made to examine need, benefits and drivers of e learning. Universities being learning organizations, merging of e-learning and knowledge management present exciting opportunities for real learning needs. The distinctive features of the teaching-learning processes require practitioner's especial attention when they are implementing ICT. The researchers suggest that organizational culture play a key role in order to achieve a useful implementation of new technologies. A conceptual model, highlighting relationships between organizational culture, individuals' behavior, and satisfaction of the actors, is developed.

Keywords: Organizational culture; Technology implementation; Innovation and behavioral changes, Knowledge management

1. Introduction

Spanish universities are Professional Bureaucracy organizations, which are adequate to stable operating work, leading to standardized behavior, and complex environment, so should be controlled directly by the operators who do it. "The organization turns to the one coordinating mechanism that allows for standardization and centralization at the same time, namely the standardization of skills" (Mintzberg, 1979). This stable environment has been changing because of the fast development of information and communications technology. Implementing ICT in education allows the possibility to rethink the teaching-learning process but this is not the unique possible benefit. The use of computers, web technologies, Internet, Intranet, and networks offer many possibilities of development at all levels of the organization and to all the workers involved in it. The success of adopting new technology not only requires changes in the design of the universities structure to facilitate the implementation of ICT but in the behavior of their members. Academic staff, students, and administrative staff need to assimilate new knowledge and change their behavior in order to develop new skills. However yet, whilst ICT use is increasing, this "transformation" has not yet occurred, and the extent and nature of ICT application in universities is still very varied and in many instances limited.

Knowledge is expanding at tremendous rate. A class graduating in the year 2005 will be exposed to more

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new information in one year than their grandparents were in a lifetime. Memorizing facts will have much lower value, while utilizing information for analysis and decisions will be a critical skill. A typical knowledge worker will have many distinct careers in his or her lifetime.

The organizations and careers of the future will utilize technologies that have not even been conceived today. These technologies will require a whole new set of skills from the workforce. Learning to use the new technology will be important, and so will using those technologies to learn. The World is shrinking rapidly. The Internet has brought the world together in ways that nobody would have expected. One can now attend a college half way around the world, with students from any country with Internet access. People will telecommute to their jobs more in future, while their companies compete globally.

System of Education in India

The role of educational institutions has radically changed, due the increasing information explosion. The formal educational institutions are the only medium and source to generate, disseminate and offer information to the students. The relationship between teacher and the taught is extremely formal and the method of educating pupil is quite rigid and stereo type. The traditional ideology of education strongly believed in one way mode of communication. It is based on the superiority of wisdom of the teachers who know everything about their subjects. The student's role is that of submission and they are knowledge seekers, who have limited understanding and knowledge level. This traditional approach hinders the development of education and institutional building, though this traditional, structured mode of management of education adopted by most institutions, in Indian may be appropriate and adequate to meet the requirements of organizations of today. Yet the view of educational planners had revolved around certain concepts that are not fitting into the present environment.

Need for a change

If India is to emerge as an intellectual capital of the World, it will have to redesign the traditional educational system and instill quality in educational institutions. This requires a change in the manner in which education system is redesigned and delivered in most institutions. It will have to create a dynamic environment that will nurture superior quality education, have state-of-the-art facilities, a comprehensive curriculum and a committed teaching fraternity.

In an attempt to revamp the existing educational, teaching and training institutions, the following features may be incorporated in training programs.

- Encouraging Innovative Thinking
- Positive Approach
- Flexible Work System
- Encouraging Group Activities
- Updating Syllabi
- Integrated Education
- Continuous Learning
- Updating Information
- Accessibility of Learning
- Simplified and Transparent Work System
- Appropriate Reward System

Especially 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 communications technology plays in the organizations (Poole and De Sanctis, 1990; Walsham, 1993; Gilliver et al 1998). These models consider information and communications technology as tools that allow alternatives that are more efficient in the management of the information system. The human action occupies a central place in these models.

Moreover, "a new technology can impact the very nature of the work being carried out to the point of imposing new requirements in the behaviors that are expected from users. Whether or not a technological

innovation ends up yielding the intended results will in part depend on whether the behavioral requirements it imposes are compatible with the current culture or whether the current culture can be altered to become compatible with those requirements" (Cabrera, A. et al., 2001). "Organizational culture has been suggested as a factor that may ultimately influence the effectiveness with which firm implements advanced manufacturing technology". (Zammuto and O'Connor, 1992). Shein, 1992, says that if we observe carefully what goes on when organizations attempt to improve their operations in response to new data from the economic, political, and technological environment, we discover the critical role that the culture and subcultures play in this process. Smircich (1983) give as a main argument to explain different results in university IT expectations the role of culture specifics.

In this paper, the researchers propose an approach to a successful implementation of ICT focusing on the key role of the organizational culture.

2. Theoretical Background

Sharing of Knowledge
Overcoming Cultural Barriers to Sharing Knowledge, an institution must keep five factors in view in adopting a mechanism for Knowledge Management. These are;
- Knowledge sharing must help solve practical problems.
- The mechanism for sharing knowledge must match with the institutional style.
- The solution for knowledge sharing must reflect the core values of the institution.
- Existing networks must be integrated.
- A motivation from the leaders and influential peers to share knowledge and learning.

Culture/Use of Computer
Theories in sociology, psychology, and organizational behavior suggest that a theory that applies to one culture does not necessarily apply, in total, to other cultures (Hofstede, 1988). Hairrson, (1972) determined that national differences make a consistent and substantial contribution to the attitudes: two-thirds national and one third individual. Swati Ketkar (1998) and Shein (1992,1996,1981) indicates that certain socio-cultural conditions have to be in place for innovation to occur.

People interact with the Information System through human interface. Culture impacts attitudes towards the use of computers. This impact is enunciated by various theories. The study of Compeau and Higgins (1995) discusses the role of individuals' beliefs about their ability to competently use computers. Theory of Reasoned Action (Fishbein and Ajzen, 1975) maintains that individuals would use computers if they could see positive benefits. Davis (1989) included two constructs in his Technology Acceptance Model (TAM). He highlights two constructs perceived usefulness and perceived ease of use. Task-technology fit (TTF) implies matching the capability of the technology to the demands of the task. Also, both theory (Fihbein and Ajzen, 2005) and a recent path analysis (Liu et al, 2002) suggest that satisfaction leads to usage rather than usage stimulating satisfaction. There is increasing evidence that the effective functioning of an application depends on its ease of use or usability (Igbaria1990).

Depending upon the level of IS growth, an IT strategy is formulated by the organizations. A proper IT strategy corresponding to a matching stage of IS growth leads to a successful implementation of IS applications in the organizations (Haywood 2000). Kenny (2000) indicates that organizations go through six stages of IT growth, initiation, expansion, control integration, data administration, and maturity. Kreps (1981) has argued that enterprises pass through levels of IT- enabled transformation, which range from localized automation (exploitation), internal integration, business process redesign, business network redesign, to business scope redefinition.

Organization systems theory and Organizational culture

The framework we use to this research is based on systems theory where organizations are adaptive organisms existing by process of exchange with their environment. It concerns with articulating patterns of contingent relationships among number of variables that appear to figure in organizational survival. There are typical variables considered in this research such as structure, size, technology, and leadership pattern. Later, researchers introduced in systems model more subjective variables, such as culture (Pfeffer, 1981; Meyer, 1981). "Although organizations are themselves embedded within a wider cultural context, the emphasis of researchers here is on socio-cultural qualities that develop within organizations." (De Long, 2000).
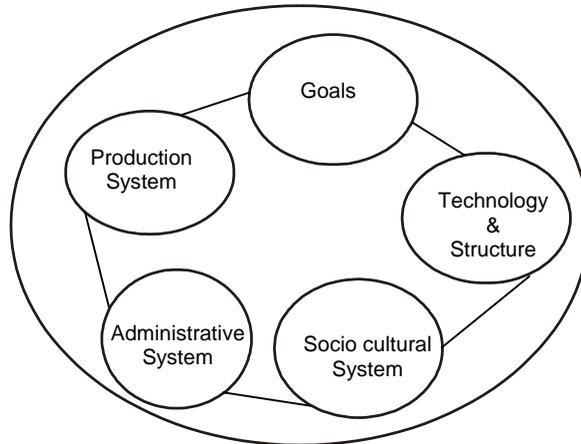

Figure 1: Culture and the systems theory framework from Smircich, 1983

3. Cultural Context

Nevertheless, the environment presents imperatives for behavior that managers may enact in their organizations through symbolic means (Pfeffer, 1981). The implication is that the symbolic or cultural dimension in some way contributes to the overall systemic balance and effectiveness of an organization. In this perspective researchers recognize that organizations are themselves culture-producing phenomena which produce not only goods and services but also distinctive culture artifacts such as rituals, legends, and ceremonies.

Culture is defined as social or normative glue that holds organizations together. It expresses values or social ideals and beliefs that organization members come to share (Harrison, 1972). There is consensus that these values or patterns of beliefs are manifest by different symbolic devices such as myths, rituals, stories, legends and specialized language.

For the purposes of this research valuable earliest references to the concept of culture as an internal organizational variable are found in the literature of Organizational Development (Jaques, 1952; Harrison, 1972). This perspective tries to enhance the adaptive mechanism within organizations. Practitioners act over the organizational development cultural subsystem questioning the values and norms under which people operate (French and Bell, 1978). This is an important device to make culture more receptive to change, facilitating the realignment of the organizational system into a more viable and satisfying configuration.

Culture, conceived as shared key values and beliefs, fulfils several important functions. First, it conveys a sense of identity for organization members (Peters and Waterman, 1982). Second, it facilitates the

generation of commitment to something larger than the self (Siehl and Martin, 1981; Peters and Waterman, 1982). Third, culture enhances social system stability (Kreps, 1981). Fourth, culture serves as a sense-making device that can guide and shape behavior (Pfeffer, 1981). In addition, Shein**,** 1996, enhance the critical role that culture and subcultures play when organizations attempt to improve their operations in response to new data, from the economic, political, and technological environment. He defines culture as the set of shared, taken-for-granted implicit assumptions that a group holds and that determines how it perceives, thinks about, and reacts to its various environments (Shein, 1992). Shein says that norms become a visible manifestation of these assumptions that most members of a culture never question or examine. The members of a culture are not even aware of their own culture until they encounter a different one.

Organizational culture is not necessarily homogeneous across all areas of the organization; different groups within the organization might develop their own subcultures. In Spanish as well as Indian universities, one can distinguish between two groups, administrative staff, and academic staff. The incorporation of new technologies requires changes in the work processes in both groups. The focus is on academic staff. A special nature of the teaching-learning processes requires particular attention when implementing ICT in an educational institution.

Evolutionary strategy for e-Learning

When any organization thinks of bringing about a change and foraying into something as e Learning, it must remember that it is challenging the age-old mindset of classroom training and therefore needs to be cautious about its approach. Both an evolutionary strategy and an implementation strategy needs to be in place. An evolutionary strategy is something that focuses on a futuristic perspective and tells an organization where it will be, in the future. It is more on the lines of a dream that an organization needs to have (Ramesh Kumar, 2003).

According to this approach, any organization has to move from a phase where it introduces e Learning to a phase where e Learning is made optional, finally to a phase where it becomes essential, and mature and then to a level where e learning becomes indispensable in the organization. In the introduction phase, the organization needs to familiarize people with the concept of e Learning. People, at this phase, do not know about e Learning and are apprehensive about the concept. Familiarization is the major focus of the organization at this phase. The next stage is where the organization gives people an option to refer to some kind of online material. The approach in usage, at this phase, is the support strategy where the e-Learning module is merely in a nature of a reference material. At this stage, people are made to realize that something in a nature of an e-Learning module exists which can be accessed by all. They are being advised to and not forced to refer to any e-Learning material.

At a next stage, organization moves to the phase where it makes e-learning essential. Some of the training needs of people, at this stage, will only be satisfied through certain e modules, and, therefore, people have no option but to refer to those modules. At this phase, the entire infrastructure is in place i.e. a Learning Management System-LMS has probably been bought and the ability to track the progress of the learners exists. The modules amenable to e Learning at this stage, are knowledge-based modules, like the SAP training module or skill based modules. This is the level at which, efforts being made to make people comfortable with e Learning. A final phase is reached only after a good span of time. At this phase, e-Learning has become indispensable in the organization. People are absolutely comfortable with the idea of e Learning and have developed exposure to e-Learning. The infrastructure is matured and virtual classrooms can be thought of. All kinds of modules become amenable to e Learning. The idea behind such a path of evolution is to build a buy-in in the organization towards the concept of e Learning. A new & aggressive concept like e learning needs to be brought about cautiously. Smart and small introduction, is what will bring fast acceptance.

Implementation strategy for e-Learning

Implementation of e Learning in the organization may be done using **'6D Approach' to e-learning** (Gunmala Suri (2005). The 6 D's stands for;

- Desire
- Disposition
- Design

- Deliver
- Drive the learner
- Determine

The strategy may be described as follows (Table 1).

Table 1: Strategies

Desire	*Does the organization need e learning?*	Need Analysis • Cost consideration • Business imperative	• Broad base learning • Change in the nature of learning
Disposition	Is the organization ready for e learning?	Readiness Assessment: • Culture • Stakeholders	• Infrastructure • Team

Design	What is model of e learning?	• Areas amenable to e-learning
		 • Model for e learning:
		  o Support model
		  o Blended model
		  o Fully online model
			• Approach to e learning:
			  o Asynchronous
			  o Synchronous
			 • In-house/off the shelf

Deliver	How will the organization provide e learning?	• Medium for e learning: Intranet and CD's • Rollout of e learning marketing pitch	

Drive the learner	How will the organization get the Staff to demand e learning?	• Sensitization of the organization towards e learning
		 • Motivating the learner
		  o Through awarding points
		  o Discussing it during appraisals
		  o Recognizing the users publicly.	

Determine	Is e learning effective?	Tracking the effectiveness of e learning or some of the following stages : • Enrollment • Scores • Action • Feedback/survey • Completion	

Pitfalls of e-learning

E-Learning providers have a bottleneck, the last yard from the monitor into the learner's brain. Without motivation, this final connection will never be made. Professional training or teaching or learning via CD-ROM may not succeed because instructors and coaches are out of picture. Certain content - because of its nature, relative value, or importance - is not suitable for technology-based delivery. While online training is especially well suited for the acquisition of IT skills, it has certain limitations in the arena of soft skills training. Other educational content that does not translate well into a virtual environment is material requiring significant hands-on application, with a strong emphasis on peer review and collaboration.

The learning process breaks down when "untouched by human hands." A ringing phone interrupts a standalone learning exercise, and CD-ROM course morph into shelf-ware. Organization that adopts e Learning as a cost cutting measure and provide no human support will not be successful. e Learning is not training by robots. e Learning as a cost-cutting measure implies that learner has to learn in his personal time which competes with family time, since he is at his desk, nobody knows he is undergoing training, if there is no peer/tutor interaction, feeling of isolation creeps in and the learner gets de-motivated. Therefore, e Learning requires commitment from the management and doesn't happen on its own.

ICT impact on Academic staff : behavioral changes

Academic staff, delivers the services that fulfil the university's basic mission. This group is one that typically becomes a target of change programs and organizational learning efforts. According to Mintzberg (1979), the Professional Bureaucracy relies for coordination on the standardization of skills and its associated design parameters, training and indoctrination. "the system works because everyone knows everyone else knows roughly what is going on" (Meyer quoted in Mintzberg, 1979, p. 349). The standardization of complex professional knowledge requires a long period of training but remains fields of considerable discretional. "Training and indoctrination is a complicated affair in the Professional Bureaucracy. All of this training is geared to one goal - the internalization of standards that serve the client and coordinate the professional work" (Mintzberg, 1979).

Although technology has been changing faster in the last one hundred years, the teaching-learning processes have been maintaining its basics characteristics. The way transmitting knowledge in the classroom today has not changed too much. The way we continue to transmit knowledge is rooted in our traditions as being humans. Ump Ganesh (1998) labeled as "practices", conventions, customs, habits, traditions and usage, because they are visible to an observer, and they understand that their cultural meaning lies in the way they are perceived by insiders. The value of the founders and key leaders shape organizational cultures but the way these cultures affect ordinary members is through shared perceptions of daily practices. Thus, positive perceptions about adopting technology will change the attitudes towards ICT and the usage of it. (Liu and Tucker, 2002). In this context, it is understand that to incorporate deep changes in the teaching-learning process using ICT it is a long and winding road. It requires behavioral changes in academic staff relating to their attitudes and perceptions towards using ICT.

Following the Theory of the Reasoned Action (Fishbein and Ajzenis, 1975), the attitude represents the degree of affection that actors feel "to or against" ICT. Davis (1989) shows that the attitude of people to the use of the information technologies is directly related to the perception these persons have about the technologies. Haywood et.al. (2000) Surveyed a sample of senior managers, academic staff and "experts" from all Scottish Higher Education Institutes to collect their opinions on the use of learning technologies. They perceived learning technologies as tools that improve the quality of the teaching process and recognize that they have the potential to improve students learning. The student motivation to learn increases when using an internet site with multimedia educational tools (Gilliver et al., 1998).

ICT uses represent the degree of usage and it allows gathering information about the creative ways of uses of ICT in teaching and learning activities. It requires not only training and specialized skills but communication and interactive abilities as well. Incorporating ICT in a university is a great opportunity to use the new technology as a means of encouraging a re-thinking of teaching and learning practices, not simply transferring established practice to an online environment. In this case, the technology becomes a medium to promote professional growth (Kenny & Mc. Naught; 2000).

Knowledge Management in University System

The driver of success in the new information order is knowledge. Knowledge embodies experience, innovation, and creativity. Learning and teaching are two faces of the same coin. University is therefore a learning organization and academics are knowledge workers. A knowledge worker holds unique values, aligns personal and professional growth with vision, adopts an attitude of collaboration and sharing, has innovative capacity and a creative mind, is willing to learn, is in command of self-control, and is willing to tolerate uncertainties and grow with the University. There are several core competencies of a self-directed knowledge worker: thinking skills, continuous learning, innovative teamwork, creativity, decisive action taking, and a culture of responsibility towards knowledge. A key ingredient in management and leadership is new way managerial experience is processed. Work management tasks include searching out, creating, sharing, and using knowledge in every day activities; maintaining work motivation; ensuring readiness to

work; allocating effort and control-switching among tasks; managing collaboration and sharing information.

Chief Academic officer has to ensure a right matches between professional need of their knowledge workers and the requirements of their jobs. A proper match results in satisfaction and hopefully a satisfied employee as viewed by management. Professional needs are many; they include achievement, ability utilization and recognition. Knowledge is a series of steps that determine the potential of a learning organization. The ultimate goal is to encourage knowledge workers to focus on thinking, using information and recommending value based change. Technology plays a major role in knowledge work. It facilitates information processing for creative thinking and intuitive planning. The use of e-mail, Intranets, and bulletin boards can facilitate information distribution and interpretation. With technology in mind, a knowledge worker is expected to possess professional experience and technical know-how to access, up date, and disseminate information and ideas from database and knowledge bases. There are several environmental, hardware, and knowledge work-system interface factors that affect the ergonomics of knowledge workers. The goal of ergonomics is to provide minimum work effort, make best use of human patterns, and provide maximum task support.

Measuring the performance of ICT implementation
User satisfaction is a widely used measure of ICT success. In prior research is referred to the extent that users believe ICT met their needs (Delone and McLean, 1992; Igbaria and Chakrabati, 1990). It relates to how well information needs are being met. In educational context it represents beliefs of students about meeting the service they need, and it represents beliefs of academics about receiving a good support not only technical but also pedagogical in order to enhance their work. A growing body of empirical evidence available suggests that ICT affect the nature of office work, job satisfaction, and the quality of the work life.
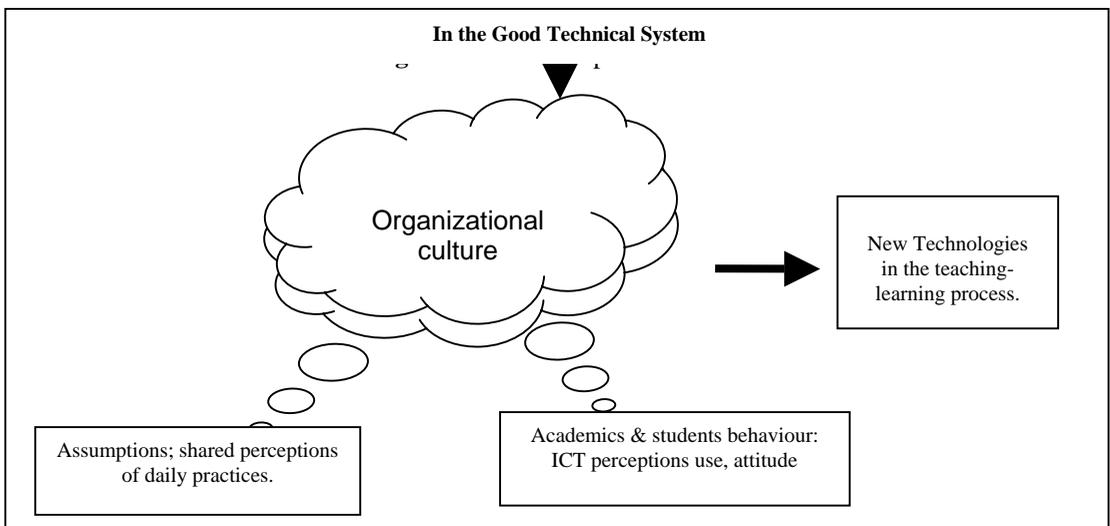

Figure 2: A Conceptual Model

4. Towards a Conceptual Model
The key role of organizational culture during the implementation of ICT in Spanish and Indian Universities. A conceptual model is supported on the theoretical framework as developed above. It shows

relationships between organizational culture, individuals' behavior and degree of satisfaction of the actors because considerable scope of possibilities that allow achieve new technologies in the teaching-learning process. The model enhances the role of organizational culture as a core factor when implementing ICT. In order to obtain a successful implementation of ICT in universities, it is important not to forget that, a good technical system is a necessary condition for the success but is not enough. The socio-cultural system is the other important side that practitioners should take in consideration in order to obtain a good implementation of ICT. Academic staff behavior may be a determinant in the success of the implementation of ICT. Their assumptions and shared perceptions of daily practices shape their perceptions and attitudes towards the use of ICT.

5. Concluding Remarks

Most of the writings and practices in knowledge management seem to focus on the content of knowledge management systems, overlooking how knowledge is presented or communicated. We believe that knowledge management is more than getting the right information to the right person at the right time. Managing knowledge occurs within a complex structured social context. That is, there must be social and human factors in the creation and exchange of knowledge (Gunmala Suri, 2005, K. Raghavendra 2003) Given the role of technology in transferring and disseminating knowledge, a true picture of knowledge is one where people voluntarily explore, use and adopt knowledge for the good of the university system and in the best interest of the organization. Such a knowledge community includes people who know one another. They use storytelling, and other forms of narrative to enrich professional peers. Cultural, organizational, and political factors must be considered in knowledge transfer and knowledge exchange (DeSancitis et al. 1994). We feel a right approach to knowledge management in a University is a unified approach, involving technology, and social, human, and organizational elements that lead to economic value. Each element and temperament has to be part of the mix, the exchange, or the approach. The behaviorists and academies have to accept the use of technology for storing and disseminating knowledge; the technologists have to understand that "tacit knowledge" and expertise are the foundations of knowledge management. The inner personalities of the academics must blend with those in technology to make things happen. It is the future of the organization, not its past or present, that is the goal of knowledge management.

A very especial nature of work processes in universities requires that practitioners during the implementation of technological changes pay more attention to organizational socio-cultural system. Academic staff have been trained over a number years to achieve knowledge and adequate skills. New technology can impact the very nature of the work being carried out to the point of imposing new requirements in the behaviors that are expected from users (Pasi Raatikainen, 2003). Behavioral changes in educational organizations are complex processes. This implies rethinking of the teaching-learning processes, and a deep learning of the new technologies and its possibilities to enhance the work processes. In a first step, Academic staff needs to inquire themselves of the way they are teaching, learning and researching till now, the implicit concepts and assumptions that underlies the educational process. A second step, it would be about learning as to how to use better ICT and develop new skills. During this process, human assumptions, perceptions and attitudes towards new technologies are playing a very important role which are part of the web of humans feelings that are present when technical staff is implementing ICT. Organizational culture is underlying these feelings through the shared values and perceptions of the members of the academic staff. A successful technological implementation requires that a organizational structure and culture be shaped to fit the demands of the new technology. Suggested model highlights the relationship between organizational culture and behavior and then focuses and shows possible critical obstacles during the implementation of ICT.

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