

December 2006

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Recommended Citation

Furner, Christopher and Mason, Robert, "Cultural Determinants of Knowledge Management System Training Outcomes: The Mediating Effect of Learning Preferences" (2006). *AMCIS 2006 Proceedings*. 172.
<http://aisel.aisnet.org/amcis2006/172>

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Cultural Determinants of Knowledge Management System Training Outcomes: The Mediating Effect of Learning Preferences

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ABSTRACT

Knowledge is lost by organizations when it is not used or when knowledgeable individuals leave the organization. Knowledge Management Systems or KMS are designed help organizations capture and retain the knowledge embedded within their people. The effectiveness of KMS is dependent the match between the match between the KMS design and the learning preferences of the user. This study aims to determine to what extent these learning preferences are dependent on culture. A survey was administered to individuals who are likely to soon become KMS users, in the USA, China and France. This study contributes to the KMS literature by demonstrating that learning preferences are related to culture, and suggests that KMS effectiveness is dependent on the match between the design on the KMS and the learning preferences of the user. Specific KMS design recommendations include incorporating group activities and providing more flexibility.

Keywords

Knowledge Management Systems, Learning, Learning Preferences, Training Modules, Culture, Multinational, China, France.

INTRODUCTION

Knowledge Management (KM) has emerged as a topic of considerable interest to researchers in organizational sciences (Turban, McLean & Wetherbe, 1996; Drucker, 2001:). Knowledge is a resource that is embedded within the employees of an organization (Grant, 1996a), and represents the quintessential resource capable of creating sustained competitive advantage, as knowledge is difficult to imitate, rare, valuable, and heterogeneously distributed across firms (Barney, 1991).

Knowledge Management Systems (KMS) are information systems that organizations use to capture aspects of the knowledge embedded in their employees and make it persistent. They do so by providing a context in which information can be turned into knowledge; that is they facilitate learning. The effectiveness of this learning is dependent on the design of the KMS, however when the KMS is a training module for new employees, learning preferences will interact with design to determine the effectiveness of the KMS in transferring knowledge. The recent technological revolution, accompanied by rapid globalization (Grimm & Smith, 1997) has led to increased cultural heterogeneity within organizations. If learning preferences are in part culturally dependent, as suggested by Vygotsky, Rieber & Carton (1987) then KMS effectiveness will depend in part on culture.

Our objective is to determine how KMS can be designed to best facilitate knowledge transfer from a learning module to an individual in multicultural organizations. To address this matter, we must determine if learning preferences are associated with culture, hence our research question is: To what extent are learning preferences associated with culture? The next step is to determine how to design KMS that effectively transfer knowledge to individuals from divergent cultures. In order to determine the effect of culture on learning preferences, a survey was administered to undergraduate students from universities in China , France and the United States.

In the next section, we review the literature surrounding KMS, learning preferences and culture. We then outline our research hypotheses. Next we discuss our methods, including our choice of subjects and data collection procedures. A discussion of contributions, limitations and potential for future research concludes the paper.

LITERATURE REVIEW

Knowledge Management Systems

KMS, are defined in the introduction as information systems that capture, store and transfer the knowledge contained within the human resources of an organization. Knowledge represents the fundamental building block upon which organizational capabilities, which enable use of resources, are built (Grant, 1996b). Alavi & Leidner (2001) argue that failure to use knowledge may lead to the loss of that knowledge. Knowledge can also be lost as experts leave the organization. KMS have the capability to preserve some of this knowledge, by storing it and making it available to other members of the organization.

Alavi & Leidner (2001) identify a framework of KMS research that has 4 components: knowledge creation, knowledge storage/retrieval, knowledge transfer and knowledge application. Researchers have so far been more concerned with the creation and storage/retrieval aspects of KMS than they have with the learning that ensues during transfer. Transfer is equally as important as creating and storing/retrieving knowledge, and all of the functions are dependent on each other. An example of a KMS is an employee-training module administered to new hires in organizations. When the KMS of interest are employee-training modules, transfer is the component of KMS that demands the most attention. The match between learning preferences and training module design are a determinant of knowledge transfer in learning module.

Learning Preferences

The effectiveness of the transfer function of a KMS depends in part on the ability of the user to learn. Learning preferences will influence how effectively individuals can learn from KMS. Learning preference scales include Kolb's (1984) experiential learning inventory, Owens & Straton's (1980) Co-Operative, Competitive, and Individualized Learning Preference Scale and Rezler & Rezmovic's (1981) Learning Preference Inventory. Two themes emerge from the literature on learning preferences: preference for structure vs. flexibility in terms of content and pace, and preference for working alone vs. working in groups. These two constructs serve as the dependent variables in this study, and are assumed to be independent of each other.

Structure vs. Flexibility

Rezler & Rezmovic (1981) delineate between teacher directed and student directed learning. With teacher directed learning, the instructor determines the content and pace of the lesson, whereas with student directed learning, the students set their own schedule and are empowered to choose what they study. These constructs will be adopted in this paper. We will refer to the preference for teacher directed learning as a preference for structured learning, and the preference for student directed learning as a preference for flexibility.

Individual vs. Group

Rezler & Rezmovic (1981) also delineate between preference for individual and group learning. Those who prefer to learn individually would rather experience the learning by themselves, without the company of peers.

Culture

For some time researchers have been aware that individuals in various civilizations share common values, beliefs, norms, and customs. Researchers have labeled the socially constructed force that embodies these factors as culture. The study of culture has its roots in anthropology, with Kluckhohn defining culture as "Patterned ways of thinking, feeling and reacting, acquired and transmitted mainly by symbols constituting distinctive achievements of human groups, including their embodiments in artifacts." (Kluckhohn, 1951 p. 86).

By bringing the concept of culture to sociology research, Kroeber & Parsons (1958) furnished a definition of culture that is consistent with the goals of the present study: "transmitted and created content and patterns of values, ideas, and other symbolic-meaningful systems as factors in the shaping of human behavior" (p. 583). A number of topologies for classifying cultures exist, the most frequently cited is Hofstede's (2001) four dimensions of culture. These four dimensions are Collectivism, Power Distance, Uncertainty Avoidance, and Masculinity. Cultures belong to civilizations, while the scores on each of the Hofstede cultural dimensions belong to individuals. This topology is adopted in the current study because it provides a rich and well articulated conceptualization of culture.

Collectivism

Collectivists value relationships with family, friends and co-workers more than individualists. Collectivists believe that group outcomes are more important than individual rewards and hardships. Norms in individualistic cultures stress independence from one's family and employer. Individualistic cultures have ceremonies to honor individuals while collectivist cultures customarily honor teams more than individuals.

Power Distance

Individuals scoring high on power distance place a high value on societal hierarchy, while individuals scoring low on power distance value societal hierarchy less. Individuals with high power distance scores believe that supervisors should maintain all decision-making authority, receive full credit for success and deserve admiration from subordinates. Individuals with low power distance scores believe that the supervisor and the subordinate are colleagues, working toward the same goal, and are similar in terms of respectability. Norms and customs in high power distance cultures include centralized decision making at the top, showing a great deal of respect for higher ranking individuals and a tendency to form bureaucratic organizations.

Uncertainty Avoidance

Individuals with high uncertainty avoidance scores value complete knowledge of future outcomes, while individuals with low uncertainty avoidance scores value complete knowledge less. So, individuals with low uncertainty avoidance scores tend to exercise more risk taking behaviors (which become norms). Customs in cultures with high uncertainty avoidance include dichotomization (conceptualizing people and situations as either good or bad, with good being mutually exclusive with bad), modularization and compartmentalization of tasks, in an attempt to simplify them (Hofstede, 2001).

Masculinity

Individuals scoring high on the masculinity dimension value ambition and acquisition of wealth; low scorers value nurturing and quality of life. The higher scoring individuals believe that failure is catastrophic, while low scorers see failure as common and find it easier to move on.

Norms in masculine cultures are congruent with their values, and include pursuit of wealth, pursuit of power and strengthening of ego. In feminine cultures, norms include relationship building, helping out those in need, and solving conflict through compromise. Customs in masculine cultures include initiation ceremonies and elitist clubs.

KMS that are designed by westerners are likely to be designed with the assumption that the users of the KMS will have western learning preferences; national cultures and ethnic backgrounds are not considered in KMS designs (Mason, 2003). Americans are highly individualistic, moderately low in terms of power distance, uncertainty avoidance and masculinity. The next section outlines the hypotheses to be tested in this study.

HYPOTHESES

We have identified two components of learning preferences; preference for structure vs. flexibility and preference for working alone vs. working in groups. Preference for structure/flexibility and preference to work individually or in groups will be retained as the dependent variables in this study. The independent variables include all four of Hofstede's dimensions of culture.

Collectivism

Individualists stress independence in their work and value individual achievement (Hofstede, 2001), whereas collectivists believe that if the group works together, they can benefit from synergies and all come out better off.

H1: People who score highly on individualism will prefer to learn by themselves

Individualists tend to have an internal locus of control (Triandis, 1995), and like to have control over their own time. They are likely to value flexibility over structure in their learning endeavors

H2: Individualists will prefer less structure in learning

Power Distance

Individuals from a high power distance culture who are faced with the prospect of working in groups are likely to immediately perceive a hierarchy emerge within that group. This is likely to lead to increased expectations, responsibilities and distress. Political behavior may ensue, creating more stress and hindering learning (Hall, Hochwarter, Ferris & Bowen, 2004).

H3: People who score highly on power distance will prefer to learn by themselves

Structure removes some autonomy and accountability from the learning process. Instructors have a higher rank than students, so if a high power distance student is given flexibility, they will be highly concerned with doing things in a way that pleases the instructor, rather than doing them in a way that maximizes their benefit received from the course. Figuring out what pleases the instructor is stressful for students. In low power distance cultures, autonomy is regularly delegated to lower ranking individuals, and the students should be more comfortable with the responsibility of scheduling their own time and deciding which topics are important.

H4: People who score highly on power distance will prefer more structure in learning

Uncertainty Avoidance

A common belief among academics is that groups bring more knowledge to the table, along with diverse viewpoints (Priem, Lyon & Dess, 1999). As such, in order to pursue complete information and diffuse accountability, individuals with high uncertainty avoidance scores will prefer to learn in groups.

H5: People who score highly on uncertainty avoidance will prefer to learn in groups.

Structure in terms of delivery and content involves less uncertainty and more clear outcomes than flexibility. As such, individuals with high uncertainty avoidance scores are likely to prefer more structure.

H6: People who score highly on uncertainty avoidance will prefer more structure in learning.

Masculinity

Masculine individuals are territorial and endeavor to outperform each other. Personal achievement is of vital importance, and working in groups only masks their ability to show off their own accomplishments. Conversely, feminine individuals engage in networking behaviors and help each other out, these qualities facilitate effective group learning.

H7: Masculine individuals will prefer to learn alone.

Masculine individuals adhere to hierarchy and believe in defined roles, with clear-cut rules and expectations by which they can evaluate themselves and their relative performance, which will make them prefer structured learning environments (Hofstede, 2001).

H8: People who score highly on masculinity will prefer more structure in learning.

Our research model is presented in Appendix 1. Having outlined our hypotheses, we move to a discussion of our research method.

METHOD

Our hypotheses aim to identify relationships between cultural and learning preference variables. In order to test our hypotheses, a cross-sectional survey was employed. Survey methodologies are appropriate when hypothesis testing is the objective and complete control of nuisance variables is not necessary or not desirable (Pinsonneault & Kraemer, 1993), as is the case in the present study.

Subjects

The retrieval function of KMS is frequently used by new employees who need to understand the processes that are associated with their jobs, and upper level undergraduate students will soon become new employees. By understanding the learning preferences of upper level undergraduates, we can determine how best to design KMS to quickly and effectively acclimate new employees to their roles.

The sample for this study consists of upper level (Senior and Junior) undergraduates at large universities (20,000 or more students) in the China, France and the United States. These nations were chosen because the individuals within these nations should exhibit adequate variation on the 4 cultural dimensions (Hofstede, 2001). Upper level undergraduates were chosen because: 1) they have had recent experience with learning, and should be prepared to respond to questions regarding their preferences, 2) their learning mechanisms have not been tainted by the pressures of work, which mask the effects of the cultural variables, and because 3) they will soon be using KMS as new hires in organizations.

Survey Procedures

To measure learning preferences, 33 questions were developed to measure preference for structure in learning (Structure) and preference for learning in groups (Group). A pilot study was conducted, in which 48 graduate students at a large university in the southeastern United States took the survey. Exploratory Factor Analysis was conducted, and after dropping some items (each construct finished with 8 items) the reliability for each factor was greater than 0.7.

The items used to measure the four culture variables were adopted from Srite’s (2000) dissertation, which were adopted from Hofstede’s (1980) original work. Exploratory Factor Analysis identified five items for collectivism and five items for power distance. Exploratory Factor Analysis yielded only two measures each for Masculinity and uncertainty avoidance. Additional items were developed for these constructs, bringing the total to 7 for masculinity, and 5 for uncertainty avoidance. These additional items were not pilot tested. The final instrument included 38 items that measure constructs, in addition to 10 demographic questions.

Surveys were translated into the native language of the country to which they were sent. A great deal of effort was made to ensure that the meaning of the questions was not distorted during translation. Each translation involved at least three people, including at least one native speaker of English and one native speaker of the language that the survey was translated into.

Analyses

Our hypotheses each predict a linear relationship between two variables, and our measures of each variable are ordinal. As such, simple linear regression is appropriate. Two simple linear regressions were run. In one regression, preference for learning in groups was the dependent variable, and the factor scores for the four cultural dimensions served as the independent variables. In the second regression, preferences for structure in learning served as the dependent variable, and the factor scores for the four cultural dimensions served as independent variables.

RESULTS

551 surveys were collected. We did not analyze incomplete surveys, leaving a final usable sample of 515. The results of our analysis are presented in Table 1. The adjusted R² for the regression with preference for structure as the dependent variable was .272. The adjusted R² for the regression with preference for learning in groups as the dependent variable was .152. For both regressions, the VIF score was 1, indicating that multicollinearity was not a cause for concern (Green, 2000). Reliabilities for our six factors were assessed, and the alphas for each factor were all greater than .7 as shown in table 2.

Variable	DV: Structure		DV: Group		Correlations					
	β	Std. Error	β	Std. Error	1	2	3	4	5	6
1. Pref. for Structure	.	.	.	.	.	.	.	.	.	.
2. Pref. for Group	.	.	.	.	-.010	.	.	.	.	.
3. Individualism	-.037	.038	-.285*	.041	-.021	-.285*	.	.	.	.
4. Power Distance	-.089*	.037	.078	.041	-.085*	.057	.034	.	.	.
5. Uncertainty Avoidance	.501*	.038	.031	.042	.500*	.030	.028	.011	.	.
6. Masculinity	-.132*	.038	.276*	.041	-.141*	.271*	-.033	-.023	-.010	.

* p < .05

Table 1: Means, Standard Deviations, and Intercorrelations Among Study Variables

Variable	α
Pref. for Structure	.786
Pref. for Group	.710
Individualism	.741
Power Distance	.707
Uncertainty Avoidance	.712
Masculinity	.763

Table 2: Alphas for each Factor

Hypothesis 1, which stated that people who score highly on individualism will prefer to learn by themselves was supported ($p < .001$, $\beta = .285$). Hypothesis 2, which stated that people who score highly on individualism will prefer less structure in learning was not supported ($p = .332$). Hypothesis 3, which stated that people who score highly on power distance will prefer to learn by themselves was not supported ($p = .057$). Hypothesis 4, which stated that people who score highly on power distance will prefer more structure in learning was not supported, although the beta coefficient was significant, it was in the opposite direction than predicted ($p = .017$, $\beta = -0.09$). Hypothesis 5, which stated that people who score highly on uncertainty avoidance will prefer to learn in groups was not supported ($p = .455$). Hypothesis 6, which stated that people who score highly on uncertainty avoidance will prefer more structure in learning was supported ($p < .001$, $\beta = 0.501$). Hypothesis 7, which stated that people who score highly on masculinity will prefer to learn alone was supported ($p < .001$, $\beta = .276$). Hypothesis 8, which stated that people who score highly on masculinity will prefer more structure in learning was not supported, although the beta coefficient was significant, it was in the opposite direction than predicted ($p < .001$, $\beta = -0.132$).

DISCUSSION

The purpose of this study was to determine if cultural characteristics have an influence on one's ability to learn from a KMS. Our results indicate that three of the four cultural dimensions examined have an influence on preference for structure in learning, while two of the four cultural dimensions examined have an influence on preference to learn in groups. Two of the findings of this study were in the opposite direction than hypothesized, and warrant additional discussion.

We had argued that structure provides a set of metrics by which individuals can compare themselves to their peers, which would be preferred by individuals from masculine cultures. However, we found that individuals who scored highly on masculinity preferred less structure in learning. Measuring the ability of individuals to perform is facilitated by structure; however structure may limit the individual's ability to actually perform by removing any opportunity to employ creativity, and thus make it more difficult to rise above the competition.

We had argued that structure removes accountability, making it attractive to people in high power distance cultures. However, individuals who scored high on power distance actually preferred less structure in learning. This may be because confident individuals in high power distance culture are less afraid of the accountability brought about by structure, and if they desire to move up in the organizational hierarchy, then structure makes it more difficult to do so, as structure removes some of their ability to show off their creativity and problem solving skills. This explanation makes sense, given that our sample of students should be relatively confident, as being seniors at large universities is an indication that they have been somewhat successful in their efforts thus far. Also, in high power distance cultures, it is more difficult for individuals who are low on the hierarchy to move up, so most college students will be from families with a fair amount of power, and will be ambitious and want to secure positions of power.

In addition, we also had three non-significant results that warrant discussion. First, we were not able to find support for hypothesis 2, which stated that people who score highly on individualism will prefer less structure in learning. The apparent explanation is that the degree to which people who score highly on individualism value being able to decide what content is important and setting their own schedule is not as strong as we had expected.

We were not able to support hypothesis 3, which stated that people who score highly on power distance will prefer to learn by themselves, owing to a desire of people who score highly on power distance to avoid the stress created when a power

hierarchy emerges within a group. Perhaps the individuals are not always able to predict this emergence of a power hierarchy before becoming involved in the group.

We were unable to find support for hypothesis 5, which stated that people who score highly on uncertainty avoidance prefer to learn in groups. Perhaps we overestimated the ability of individuals to appreciate the potential benefits of group learning. In addition, individuals from high uncertainty avoidance cultures may feel uncomfortable giving up any control of their learning efforts to others.

LIMITATIONS, CONTRIBUTIONS AND OPPORTUNITIES FOR IMPROVEMENT

While our results are interesting and contradict the culture free hypothesis (Miller, 1987), it is important to note their limitations. First, our sample consists only of undergraduate students. While these students are preparing to enter the workforce and will soon be faced with using KMS for training purposes, they are not the only users of the KMS, so the implications that we have outlined will not apply to all users of KMS.

Limitations with the measures are also present. While the four cultural variables that we employed are consistently used by researchers in a variety of disciplines, they are not exhaustive, and more cultural variables could be considered, such as context, time (monochronic vs polychronic), and formality (Hall, 1989; Hall, 1990). Other learning preferences can be included in future studies, such as preference for abstract conceptualization vs. concrete experience (Kolb, 1984). Finally, further study, with attention to learning outcomes is warranted.

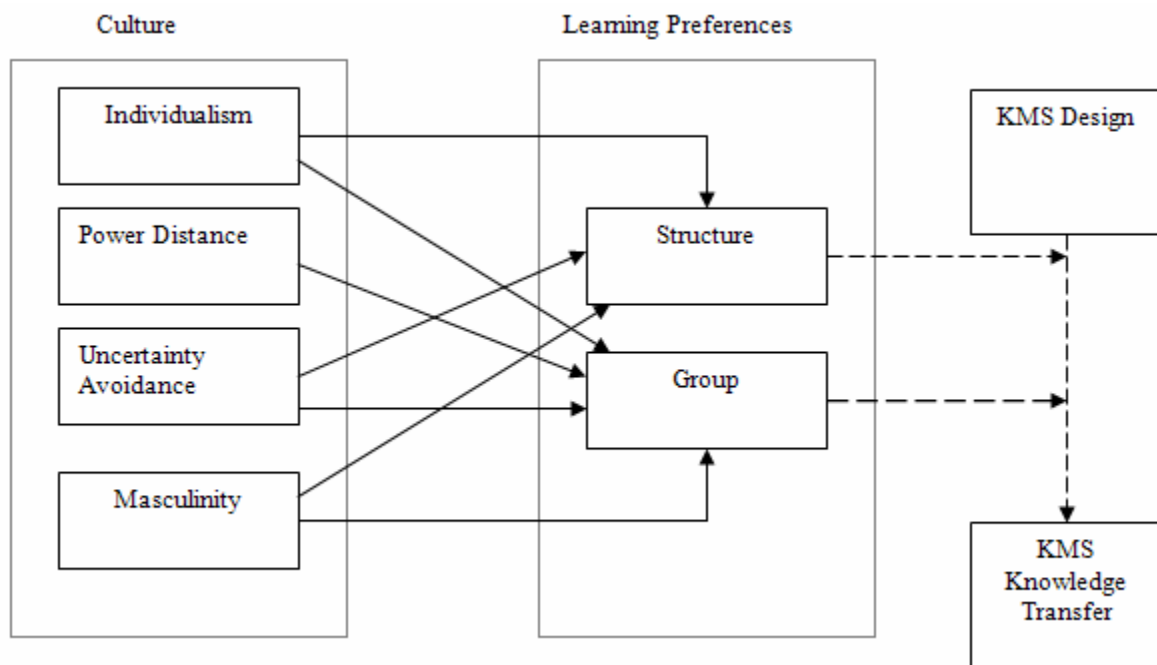
Overall, we have been able to show cultural effects on learning preferences, which carry important implications for developers of KMS in multicultural organizations that utilize employee training modules. Our findings indicate that KMS developers should be aware of the projected cultural make up of their organization, and design training modules that cater to the learning preferences of the users. A post-hoc ANOVA using the data collected in this study revealed that Americans prefer more structure and prefer to learn alone, more than Chinese. As such, Americans are likely to design KMS that facilitate learning alone with a high degree of structure. KMS designers in multicultural organizations should take care to include modules that involve group activities and that are more flexible in order to maximize the effectiveness of knowledge transfer.

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Appendix 1: Research Model



----- = Not Tested