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Influence of Personal Factors on the Knowledge Sharing Attitude of Individuals in Engineering Education Context

Yogeesha H. C[1], S.G. Gopala Krishna[2]

[1]Associate Professor – Mechanical Engineering Department, Nagarjuna College of Engineering& Technology, Bengaluru

[2]Principal, Nagarjuna College of Engineering& Technology, Bengaluru

Abstract: ***This study intends to understand the influence of individual components of the personal factors on the attitude concerning the knowledge sharing intention or behaviour in the context Engineering Education in Karnataka State, India. The personal factors considered for the study are: age, gender and experiencein the field of engineering education. The data for the said study was collected from the online survey. From thestudy, it isobservedthat only two factors, i.e. the age and experience werefound to be statistically significant in influencing an individual's attitude towards knowledge sharing. It proposes that there is no deterministic individual factors that inhibit the knowledge sharing attitudes based on gender.***

Keywords: Knowledge Sharing, Knowledge Management, Technical Education

1. Introduction

Knowledge can be considered as a fluid mix of expert insight, framed experiences, circumstantial information, values and grounded intuition that provides a framework for evaluating and incorporating new experience and information [1]. Knowledge is the understanding of a specialized area of concern that has been assimilated over the years of experience [2].

Knowledge has turned into the most essential consideration in all most all organisations. An emphasis on knowledge as a strategic advantage is vital because improving the management of this asset can enhance the efficiency and effectiveness of the organization and help in meeting the future challenges. Globalisation, information technology, communications systems and the exponential growth of knowledge all contribute to an increasingly complex environment in which information is abundant and volatile. Numerous experts contend that an organization‟s capability to perform well in the information age depends on its capacity to utilize knowledge effectively. In many private sector organizations, knowledge has become a critical source of comparative advantage as companies increasingly draw on factors such as employee‟s know-how and innovative capacity to remain competitive[3].To be more productive and competitive within a given field of specialization, employees need to access the necessary knowledge in more efficient ways than others do [4]. Survival in this aggressive and competitive world is subjected to the best possible response provided by the organizations to the huge number of challenges. Managing knowledge implies adding and creating value of knowledge by leveraging the know-how, intuition, judgement and experience within and outside the organization.

Organisations are attempting to find new and systematic ways to recognize and convert individual expertise, insights, experiences and skills into organisational knowledge. The strategic management of knowledge resources is viewed as one of the important factors for sustainable competitive advantage.

2. Knowledge Management and Knowledge Sharing

Knowledge management can be seen as turning data (raw material) into information (finished goods) and from there into knowledge (actionable finished goods)[5]. The implication of this conversion of data into knowledge and management of the knowledge gives an individual the power to make the right decisions that are value producing to the company. The main goal of Knowledge Management is to build and effective usage of the intellectual capital. Suitable measures can be implemented by the organizations to leverage the organisational knowledge for creating business value and sustainable competitive advantage.[6]. Knowledge Management is a systematic method for maximizing the creation, sharing, and effective use of knowledge to support organizational learning, competitiveness and ultimately the performance of the organization.

Knowledge can be leveraged only when people value the building of knowledge on each other‟s ideas and sharing their own insights. Knowledge sharing is considered as the most essential part for knowledge management as it positively affects creativity, team performance, working environment, cohesion, knowledge integration and effective decision making [7][6].Knowledge sharing is the process where individuals mutually exchange their knowledge and jointly create new knowledge. Knowledge sharing can also be defined as the action of the individuals in making knowledge available to others in an organizational context [8]. Barton and Srivatsava [9] viewed knowledge sharing as sharing organizationally relevant and important information, ideas, experience, suggestions and expertise with one another.

By sharing knowledge, individuals contribute to the creation of the knowledge base, innovativeness and ultimately competitive advantage of their organization [10]. In a survey of 260 CEOs and directors in European multinational organisations conducted by the Financial Times in 1999, 94% of respondents answered that people should share what they know with others[6]. However, knowledge sharing is often argued as an unusualand unnatural act[1]. Individuals will not share their knowledge as they think that knowledge is their power and is important and valuable to them. The biggest hurdle in managing knowledge is changing the behaviour of the individuals towards knowledge sharing and contributing to the knowledge base of the organization [11].

Sharing knowledge is not a natural process. Many a times, individuals question the reason for sharing the knowledge as they feel that knowledge is a valuable resource, and sharing it may put their jobs at risk if others use their knowledge. An individual‟s knowledge in the organization is the primary source of power, giving up or sharing that knowledge diminishes the value or uniqueness of the individual [12]. As a consequence of this, the individuals may fear a loss of superiority and ownership of the unique knowledge after sharing it. Therefore, individuals try to hoard knowledge rather than to share[1][13]. Employees accomplish the assigned work by keeping their knowledge to themselves for their own benefit, rather than sharing it with others. As per the old school of thinking, where profitability was reflected by organization‟s output, knowledge hoarding was believed to be benefitting the career advancement of the individuals. Brown and Woodland stated that individuals use knowledge both for defence and control[14]. When individuals perceive the knowledge they possess as a valuable commodity, KS becomes a process mediated by decisions about what knowledge to share, when to share, and who to share it with [15].

Knowledge management requires a shift in the behaviour of individuals where knowledge sharing, collaboration and team working are valued as well with individual achievement. The vital component to the implementation of knowledge management is the shift in the belief that knowledge sharing is power.

Knowledge is mainly derived from past experience, which leads to sound judgement and wisdom[1]. Wisdom is the knowledge that is used in making future decisions. Being able to transfer knowledge implies that experiential knowledge also gets transferred to the recipient. The benefit of experience lies in the fact that it provides a historical perspective that helps people better understand present situations. Experienced people are usually valued in a company (and are often paid more) because they possess this historical perspective from which they can view current situations – something that a typical newcomer will almost never have.

Organisations need to examine the individual‟s attitudes and habits concerning knowledge sharing. They need to monitor with whom the employees collaborate, how they get the information they need, whether and when they document their own knowledge and how they store and distribute knowledge. Hence, the aim of this research is to develop an understanding of the personal factors influencing an individual‟s attitude towards knowledge sharing behaviour in the context of technical education.

3. Personal Factors Influencing Knowledge Sharing

Attitude is the way an individual think or feel about something. An attitude can be as a positive or negative evaluation of the other individual, object, event, activity or an idea. It could be just about anything in the environment the individual is working. Attitudes are closely related to values, and are about how people view their world. Attitudes are born out of what we know (cognitive), feel (emotions), and do (behavior) about someone or something. They are shaped by education, environment and by the culture to which people belong. Attitudes often result in and affect the behaviour or action of the people. Attitudes can lead to intended behaviour if there are no external interventions. Values and attitudes shape many of the ways a person behaves. Values reflect a person‟s ethos about their work and their interaction with the people connected. They rarely change. Attitudes can change where people see that it is necessary [16].

The way an individual reacts to and addresses a situation is influenced by many factors such as abilities of an individual, his/her gender, age, perception, and attitude. Abilities of an individual consists of intellectual, physical and self awareness abilities. The psychological, physical and self assurance characteristics owned by an individual defines the behaviour of the persons in personal and social life.

The personal factors which influence the individual behaviour can be of two types, viz. biographical characteristics such as age, gender, religion, marital status, experience, intelligence, personality, perception, attitude, values, etc. and environmental factors such as employment level, salary/wage, available technology, physical facilities at the workplace, organizational structure, leadership and reward system.

It is suggested that the easiest way to approach the subject of knowledge management is for individuals to make themselves aware of how they deal with their own knowledge and emphasise that an atmosphere of trust is essential for the sharing of knowledge [17].

4. Theoretical Framework

To build a theoretical model which decides personal influences affecting knowledge sharing attitudes, it is proposed to use the Theory of Reasoned Action (TRA). The useful aspect of the Theory of Reasoned Action is that it assumes all other factors influence behaviour only indirectly, by influencing attitude [6]. Because it has this explanatory power, the Theory of Reasoned Action can be a useful model for explaining knowledge sharing behaviour in organisations.

The Theory of Reasoned Action is a widely accepted model in social psychology, used to explain virtually any human

behaviour. According to this theory, a person‟s performance of a specific behaviour is determined by his or her behavioural intention to perform the behaviour. Next, the intention is jointly determined by the person‟s attitude and subjective norm concerning the behaviour in question. And then, a person‟s attitude toward a behaviour is determined by his or her salient beliefs about the consequences of performing the behaviour, multiplied by the evaluation of those consequences. Finally, an individual‟s subjective norm is determined by a multiplicative function of his or her normative beliefs and motivation to comply [6].

5. Research Hypothesis and Methodology

The objective of this research is to explore the personal factors influencing attitudes towards knowledge sharing. The purpose of this study is explanatory. This study hypotheses that “there is a relationship between personal factors and attitude of individual‟s towards knowledge sharing”. Various sub-hypothesis can be stated by substituting the generic “personal factors” with specific factors under consideration, namely: Gender, Age and Experience.

The study will adopt a quantitative online survey-based approach to test the corresponding null-hypotheses. The purpose of this study is explanatory as it seeks to establish whether attitude towards knowledge sharing is determined by such variables as gender, age, education and experience.

The questionnaire administered was developed by Bock and Kim[6][18]. The instrument measures respondents‟ attitude towards knowledge sharing. Attitude towards knowledge sharing was defined as the degree of one‟s positive feelings about sharing one‟s knowledge. Variables were measured on a five point Likert-scale ranging from1 (very rarely) through 5 (very frequently).

Data Collection

Target population of this study was defined as faculty members working in engineering colleges affiliated to a Technological University in Karnataka state, India. There are about 30,000 faculty members working in various engineering colleges affiliated to a Technological University in Karnataka state. They are teaching both undergraduate and post graduate courses. These faculty members are working in the institution with the minimum qualification of a post graduate degree and can have doctoral degree also.

The sample size for the said study is calculated based on 95% of confidence level and the formula adopted from Yamane[19].

$$n = \frac{N}{1 + N(e^2)}$$

Where n – sample size, N – Population size and e-level of precision.

When the formula is applied to the given study with a population size of approximately 30000 and level of confidence of 0.05, we get the sample size as 395. We have chosen the random purposive sampling technique and considering the percentage of useful responses to be around 60%, we have arrived at the sample size as 628.

Faculty members from different branches and different colleges were selected randomly and the online questionnaires were sent to the selected faculty members to elicit their responses on knowledge sharing intentions.The questionnaire was prepared using Lime survey, a free open source software survey tool on the web. The link to the survey was sent to the selected target population through emails and the responses were collected using the online survey tool. The responses received were screened and useful responses were taken for the study.

6. Analysis of the Data

To test the identified hypothesis, the numeric variables „age‟ and „experience‟, captured in years, were converted into categorical variables. This permitted an analysis to be performed, namely using the Pearson chi-square test for the significance of association, which is more relevant to the objectives of the research.

It is found that there is significant correlation between age on the one hand and experience and education on the other. The statistical test performed for testing the stated hypothesis was the Pearson chi-square test. In addition, linear regression and ANOVA was also performed.

Table 1: Frequency table for "attitude towards knowledge sharing"

Frequency	*Category*	*Frequency*	*%*
Attitude < 2	Low	70	11%
Attitude >= 2 and Attitude < 3	Medium	176	28%
Attitude >= 3 and Attitude < 4	Medium – High	254	40%
Attitude >= 4	High	128	20%

In order to perform chi-square analysis, all continuous variables are converted into categorical data. Although this process may introduce bias, it was found that the results were not particularly sensitive to the exact cut-off values used to group data. Table 1 above shows the 4 classes which were created for the variable attitude. The labels such as low and high are arbitrary and relative to the responses obtained. The use of these labels is purely intended to facilitate the reading of the statistical results and they should not be interpreted strictly.

Attitude vs Gender

The gender of the respondents was studies and correlatedon attitude towards knowledge sharing.

Table 2: Influence of Gender on Attitude towards knowledge sharing

Attitude	*Male*	*Female*	*Row totals*
Low	46	38	84
Medium	92	84	177
Medium – High	163	90	253
High	65	49	114
All groups	367	261	628

The chi-square value was found to be 2.41, which has a significance of 0.41 (df=3), i.e. p-value > 0.05. This implies that there is no association between attitude and gender. The lack of association – or even any suggestion of association – is certainly an interesting finding and demonstrates clearly the danger of holding gender-based prejudices.

Attitude and Age

Table 3: Age and knowledge sharing attitude

Attitude	*Age: < 30*	*Age: 30-40*	*Age: 40-50*	*Age: >50*	*Row totals*
Low	30	24	14	16	84
Medium	33	71	24	49	177
Med – High	43	65	57	87	253
High	30	16	38	30	114
All groups	136	177	128	188	628

The chi-square value was 15.5, which has a significance of 0.02, i.e. p-value < 0.05. This means that there is a definite correlation between attitude and age. Therefore the null hypothesis of no association between age and an individual‟s attitude towards knowledge sharing must be rejected, and the alternate hypothesis of an association between age and attitude can be accepted.

However, if the influence of age on attitude towards knowledge sharing is tested by means of linear regression analysis, the regression test only indicates a weakly positive (r^2= .012) influence on attitude by the respondents‟ age with a p-value of only 0.059 i.e. not statistically significant. An ANOVA analysis reveals that some of the problems may be due to a more dispersed spread of attitudes for this group, with a heavy low-end tail, indicating that there is more probability of very young respondents having a low attitude than the other age categories. Hence, it must be concluded that there is a definite correlation between age and attitude towards knowledge sharing, but this is not of a linear nature.

Attitude and Experience of the respondents

Table 4: Experience and knowledge sharing attitude

Attitude	*Less than a year*	*1 to 5 years*	*5 to 10 years*	*> 10 years*	*Total*
Low	43	27	11	3	84
Medium	106	38	14	19	177
Med – High	114	76	16	46	253
High	63	38	3	11	114
All groups	326	179	43	79	628

The chi-square value was 12.3, which has a significance of 0.04, i.e. p-value > 0.05. This suggests that there is astatistical basis to assume an association between attitude and experience.

Table 5 below presents a summary of the test results for each of the personal factors which were hypothesised to have a potential influence on attitude towards knowledge sharing. It must be noted that the actual chi-square analysis tests (two-way) association rather than unidirectional influence.

Table 5: Summary of findings

	Pearson chi-square test statistic	*P< 5% significance level*	*Association/ influence?*
Gender	2.41	0.41	No
Age	15.5	0.03	**Yes**
Experience	12.3	0.24	**Yes**

From the Pearson chi-square test for significance of association, the significant finding were the association between attitude and age as well as attitude and experience in the field of engineering education.

7. Conclusion

The research focused on the personal factors gender, age and experience and on how these factors influence an individual‟s attitude towards knowledge sharing.The findings of the report suggest that the attitude towards knowledge sharing is influenced by age as well as experience in the field of engineering education.

The findings of this research must be treated with caution given the limitations of the study. The sample design of randomly selected faculty members from affiliated engineering colleges in Karnataka state may have been biased. The effect of this sampling design on the ability to generalise results to the whole engineering education sector is not clear. Also, the sample was from a large population, which therefore limits the ability to generalise to particular academic sector.

However, the lack of support for the influence on knowledge sharing attitude of personal factors such as experience or gender can be seen as a positive and hopeful indicator. It suggests that there is no deterministic individual barrier against knowledge sharing attitudes based on gender and experience.

Areas for future research could include possible theoretical explanations for why age influences knowledge sharing attitude. Additionally, it would be useful to research the organisational and technological factors that influence knowledge management implementations in an academic context. Finally, the effect of rewards or incentives on knowledge sharing, could be investigated, to determine whether they are a significant factor in academic context.It is hereby felt that a more qualitative research methodology be more appropriate to investigate in more detail what factors affect knowledge sharing attitudes of individuals in academic environment.

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