CORRELATIONAL STUDY OF ORGANIZATIONAL COMMITMENT, SELF-EFFICACY AND PSYCHOLOGICAL BARRIERS TO TECHNOLOGICAL CHANGE

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Relationship among organizational commitment, self-efficacy and perceived psychological barriers to technological change was studied in a sample of 167 male managers selected from Tata Engineering and Locomotive company, Jamshedpur, Jharkhand, India. Organizational Commitment Scale developed by Allen and Meyer (1990), Generalized Perceived Self-efficacy Scale by Schwarzer and Jerusalem (1995), Questionnaire to measure Psychological Barriers to Technological Change by Ghani and Sugumar (1999) were the tools. Results revealed that organizational commitment is positively related with age, length of service in present cadre and self-efficacy and negatively with psychological barriers to technological change. Psychological barriers to technological change were found to be positively related with age, length of service in present cadre and negatively with self-efficacy. Negative correlation coefficients were found between self-efficacy and age and also between self-efficacy and length of service in present cadre. Multiple regression analysis was done to see the relative contribution of different variables.

Key words: organizational commitment, self-efficacy, technological change

Technological change, driven largely by the continuing evolution of computer based systems, continues to revolutionize the nature of work and job requirements (Turnage, 1990). This technology not only creates new types of jobs but may fundamentally change the way people relate to one another in organizations, it may eventually, change the basic nature of organizations.

Indian manufacturing firms have been encountering with ever more severe competition from abroad. There has been much discussion of the adoption of new manufacturing technologies to enhance competitiveness. While some firms have moved ahead in their technological change, the majority is in the process of changing. The new technologies that have become prominent in India in manufacturing sector are computerized design and manufacturing. As this Advance Manufacturing Technology (AMT) has excited a vision of competitive advantage (Preece, 1995) by increasing productivity, many large companies have introduced AMT in their manufacturing activities. But most of those companies, which introduced AMT, have complained that real gains out of this technology remain modest. The reasons attributed for poor performance are human barriers, which are mostly psychological (Ghani & Sugumar, 1999).

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The right perception of technological change by employees contributes to successful adoption of new technology. Misconception of technological change must be eliminated before implementing new technology by educating the work force. The productivity of the firm at first drops because of the resistance to new technology (Gaynor, 1996). The introduction of new technology without the involvement of employees leads to confusions and rumors on the shop floor. Operators, who are not identified in time to work with advance technology, do not have a clear idea about their job role. This results in reluctance, lack of enthusiasm and less commitment among employees.

Studies have suggested that individuals with high level of self-efficacy are more likely to choose to participate in challenging assignment and take responsibility for personal development than individuals with low level of self-efficacy (Bandura, 1982; Bandura & Schunk, 1981).

Technological changes challenge employees to learn new skills, change behaviours or reconsider attitudes. It is believed that self-efficacy indirectly influences development activity through its effects on learning attitudes, perceptions of benefits resulting from technological changes i.e., the higher the employees’ self-efficacy, the more positive their learning attitudes, the stronger their beliefs that they will receive greater benefits from participating in development activities and the greater their awareness to development needs.

Information technology often has resulted in downsizing and has had a flattening effect on today’s organization structures. Technological change may have short-run cost savings, outcomes such as increased resistance to change, therefore, increased conflict, decreased employee commitment can have a significantly negative long run impact on the organization (Cameron, 1994).

The literature on many different types of management programs says that effective programs installations depend on the level of top management commitment: the stronger the commitment, the greater the potential for program success. Full-fledged commitment from top management has been critical to the success of computer-aided decision support systems (Neumann & Hadass, 1980) and just-in-time materials planning program (Duncan, 1989).

Since the psychological barriers do not stand in isolation, they are linked to various other variables; hence the present study encompasses the relationship between organizational commitment, self-efficacy, and perceived psychological barriers to technological change in the managerial cadre.

With the above view this particular study would not only enhance the management insight into the related field but on the other hand would also make them analyze the causes leading to such psychological barriers and hence enable them to come up with feasible solutions to such problems.

Hypotheses:
1. Higher the self-efficacy of the workers, lower the perceived psychological barriers to technological change.
2. Higher the organizational commitment of the workers, lower the perceived psychological barriers to technological change.
3. Self-efficacy of workers would have positive relationship with their organizational commitment.

**METHOD**

**Sample:**

The sample consisted of 167 managers, selected at random from 969 male managers working in the manufacturing unit of Tata Engineering and Locomotive Company, Jamshedpur, Jharkhand, India. This company is manufacturing tractors, cars, etc. Their mean age was 40 years and mean length of service in present cadre was 8 years and 6 months.

**Tools:**

*Organizational Commitment Scale*

Allen and Meyer (1990) developed this scale. It comprised of 24 items divided into 3 components i.e. Affective commitment (AC), Continuance commitment (CC) and Normative commitment (NC). Respondents were required to rate items on a 7-point Likert scale ranging from strongly disagree to strongly agree.

The reliabilities for each of the three scales were as follows- ACS .87, CCS .75, NCS .79. Convergent and discriminant validity was established for these scales.

*Generalized Perceived Self-efficacy Scale*

The German version of this scale had 20 items. Later, Jerusalem and Schwarzer (1992) reduced it to 10 items. In 1995, English version was developed by Schwarzer and Jerusalem (1995).

Coefficient alpha ranged between .75 and .91. Convergent and discriminant validity was established.

*Psychological Barriers to Technological Change Scale*

This scale was developed by Ghani and Sugumar (1999). It is based on ten conceptual factors namely, (1) problems of learning, (2) techno-uncertainty, (3) techno-phobia, (4) alienation, (5) techno-stress, (6) fear of work load, (7) misconception of technological change, (8) job security and personal benefits, (9) loss of role identity and (10) de-skilling. Each item of the questionnaire was to be answered on the basis of three options, Yes/Don’t know/No. There are 37 items. Coefficient alpha for the ten factors ranged between .66 to .82. Construct validity was established through factor analysis.

**RESULTS**

The correlational analysis revealed that the hypotheses were confirmed and it was found that the negative relationship exists between self-efficacy and psychological barriers to technological change. Self-efficacy was found to be positively related with organizational commitment. Organizational commitment was found to be negatively related with psychological barriers to technological change (Table 1).

For the various components of psychological barriers to technological change the mean values indicated that techno-stress was found to be highest among managers ($M=5.9$, $SD=1.88$), followed by job security ($M=5.07$, $SD=1.82$) and techno-phobia ($M=3.54$, $SD=1.82$), techno-uncertainty ($M=3.37$, $SD=1.11$), problem of learning ($M=3.01$, $SD=1.79$), fear of work load ($M=1.73$, $SD=.48$), alienation ($M=1.6$, $SD=.09$), misconception of technological change ($M=1.54$, $SD=.8$), de-skilling ($M=1.54$, $SD=.68$) and loss of role identity ($M=.83$, $SD=.43$).

For the multiple regression analysis, age and length of service in the present cadre were added as predictor variables along with self-efficacy and organizational
commitment, when psychological barriers to technological change was the dependent variable. The $R^2$ value was found to be .34, which indicates that 34.15% variance in the dependent variable variance, is to be explained by the combined predictor variables. Multiplying beta weights by the corresponding $r$ each variable’s contribution to the variance is seen (Guilford, 1956). Out of the total variance of 34.15%, self-efficacy contributed the most i.e., 17.5%, organizational commitment 8% and length of service in present cadre 8% (Table 2). The obtained multiple regression equation states that for

$$
Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4
$$

Table 1. Correlation Coefficients Among Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>SD</th>
<th>Age</th>
<th>LSPC</th>
<th>SE</th>
<th>TC</th>
<th>OC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>40.67</td>
<td>11.75</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LSPC</td>
<td>100.10</td>
<td>79.66</td>
<td>.62**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SE</td>
<td>32.13</td>
<td>4.33</td>
<td>-.11</td>
<td>-.16*</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TC</td>
<td>112.74</td>
<td>20.91</td>
<td>.11</td>
<td>.28**</td>
<td>-.44**</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>OC</td>
<td>28.10</td>
<td>10.90</td>
<td>.43**</td>
<td>.23**</td>
<td>.21**</td>
<td>-.28**</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: *$p<.05$, **$p<.01$

LSPC=Length of Service in present cadre, SE=Self-efficacy, TC=Perceived Psychological barriers to technological change, OC=Organizational commitment

Table 2. Multiple Regression Analysis for Perceived Psychological Barriers to Technological Change Scores

<table>
<thead>
<tr>
<th>Variables</th>
<th>B</th>
<th>SEB</th>
<th>Beta</th>
<th>$t$</th>
<th>Sign. $t$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>.01</td>
<td>.03</td>
<td>.01</td>
<td>.42</td>
<td>.46</td>
</tr>
<tr>
<td>LSPC</td>
<td>.04</td>
<td>.02</td>
<td>.30</td>
<td>2.16</td>
<td>.03</td>
</tr>
<tr>
<td>SE</td>
<td>-.83</td>
<td>.23</td>
<td>-.40</td>
<td>-3.68</td>
<td>.00</td>
</tr>
<tr>
<td>OC</td>
<td>-.16</td>
<td>.07</td>
<td>-.30</td>
<td>-2.33</td>
<td>.03</td>
</tr>
<tr>
<td>Constant</td>
<td>67.66</td>
<td>9.02</td>
<td></td>
<td>7.50</td>
<td>.00</td>
</tr>
</tbody>
</table>
every unit increase in age (X₁) and length of service in present cadre (X₂), led to an increase in perceived psychological barriers to technological change by their b coefficients of .01 and .04 respectively whereas for every unit increase in self-efficacy (X₃) and organizational commitment (X₄) there is the decrease in perceived psychological barriers to technological change by their b coefficients of -.83 and -.16 respectively. The obtained t values indicated that except age other variables were found to be significant predictors of perceived psychological barriers to technological change.

When organizational commitment was taken as dependent variable the multiple R=.57 and R²=.32 were found. Comparing the relative contribution of different predictor variables, age contributed 16%, psychological barriers to technological change 8%, length of service in present cadre 4% and self-efficacy 3% of the variance in organizational commitment (Table 3). The obtained multiple regression equation states that for every unit increase in age (X₁), length of service in present cadre (X₂), and self-efficacy (X₃) there is the increase in organizational commitment by their b coefficients (.70, .04 and .69 respectively) whereas perceived psychological barriers to technological change led to a decrease in organizational commitment by its b coefficient of -.57.

**DISCUSSION**

The findings of the present study show that the negative relationship exists between
self-efficacy of workers and psychological barriers to technological change. Self-efficacy has consistently been found to be associated with work related performance in numerous studies, including those of coping with difficult career-related tasks (Stumpf, Brief, & Hartman, 1987), career choice (Lent, Brown, & Larkin, 1987) and adaptability to new technology (Hill, Smith, & Mann, 1987). People with strong self-efficacy beliefs exert greater efforts to master a challenge while those with weak self-efficacy beliefs are likely to reduce their efforts or even quit (Bandura & Schunk, 1981; Brown & Inouyne, 1978; Schunk, 1981; Weinberg, Gould, & Jackson, 1979).

Another finding of the present investigation is that organizational commitment is found to have significant negative relationship with psychological barriers to technological change. This finding is consistent with the results obtained by Agarwal (1997) that the organizational commitment is negatively related with organizational change. Organizationally committed individuals are less likely to be absent from or quit their jobs compared with their less committed co-workers (Farkas & Tetrick, 1989).

A study by Bruning and Synder (1983) reported that older individuals with seniority in their positions tend to evince higher organizational commitment. Similarly, Balasubramanian, Sathyamoorthy, and Kumar (1996) found that elder officers are more committed to their organization than the younger ones.

The results of the present study also indicate positive relationship between age of employees and their organizational commitment i.e., as the age of employees increase their commitment also increases. Age is said to be a major differentiator of employees’ values, as youngers place a higher importance on personal freedom, short-run gratification, flexibility, leisure time, individualism and openness than their parents do (Cherrington, Condie, & England, 1979; Robbins, 1993), whereas elder employees give higher importance to money, economic stability, status, hard work and loyalty to the organization as compared to younger employees (Robbins, 1993). Multiple regression analysis also indicated the effect of age to be higher than the other three variables on organizational commitment.

Results suggested that with the increase in length of service in present cadre organizational commitment also increased. Huselid and Day (1991) had also found negative correlation between tenure and intention to quit i.e. the more the tenure of employees, the more they are committed. Lee (1971) found that organizational identification or affective commitment was determined partly by the length of service.

Results suggested that self-efficacy is positively related to organizational commitment but only 3% variance in organizational commitment is explained due to self-efficacy variable. This suggests that high self-efficacy of an employee may not always be beneficial for the organization. Self-efficacy is a task specific construct (Gist & Mitchell, 1992) that describes a judgment of perceived capability for performing a specific task (Bandura, 1988; Wood & Bandura, 1989). If the ask is beneficial for an individual employee and is not beneficial for the organization then higher self-efficacy would benefit the individual, but may be detrimental to the organization if the individual decides to undertake the task. If employees have high self-efficacy in finding employment, however, the resulting turnover may not be beneficial for the organization.
This study would help the firms to diagnose and identify the psychological barriers to technological change before, during and after the implementation. It would help the authorities to plan the change process well in advance so that psychological barriers of the employees can be minimized and new technology may be implemented to achieve superior performance without much loss of time (Davis, 1994).

The results of this study have theoretical as well as practical implications. Organizations should learn how to increase their employees’ self-efficacy judgments about their abilities to complete relevant/remote work task, which could lead to improved performance. Training is considered as an important source of information and experience for changing self-efficacy beliefs. Thus, self-efficient employees would have less resistance to change.

Another important implication is that organizations must be able to reinforce employees to stay in the same organization for longer period and increase their organizational commitment. Hence, committed employees would have less barriers to change. High performance of employees will result when there is a positive change in attitudes as a result of elimination of psychological barriers to accept new technology by a planned change process (Ghani & Augustine, 1999).

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