

The Impact of Communication Quality and Frequency on Organisational Learning during New Product Development

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Abstract

This paper examines how communication behaviours influence organisational learning during new product development (NPD). Partial least squares is used to test a model examining the effects of communication quality and frequency on four organisational learning dimensions (i.e. team orientation, systems orientation, memory orientation, and learning orientation). The results indicate that both communication dimensions positively influence the four organisational learning dimensions, with communication quality having the stronger effects. Our findings suggest that communication frequency should be coupled with communication quality during NPD if firms wish to increase organisational learning.

Introduction

Organisational learning involves firms acquiring, utilising, and disseminating information and thus is an important strategy for improving a firm's competitive advantage (Chan and Scott-Ladd, 2004). Despite its importance, research on organisational learning has suffered from intermittent attention and it is only recently that there has been a more focused stream of research on this construct (Dawes, Lee, and Midgley, 2007). Organisational learning has been examined in a number of contexts, such as its influence in a purchasing process (e.g. Dawes et.al, 2007; Hult and Ferrell, 1997), its link with values, knowledge, and behaviour (e.g. Sinkula et al. 1997), and its impact on innovation and performance (e.g. Aragon-Correa et al. 2005). Moreover, recent research (e.g., Rama and Massey 2007) investigated the link between three communication behaviours – communication quality, frequency, and bidirectionality, and the global construct organisational learning. Their results revealed significant relationships between each communication behaviour and organisational learning. However, in order to gain a better understanding of organisational learning, here we test the impact of two communication behaviours on the four underlying dimensions of organisational learning.

Many studies recognise the importance of intra-firm communication on business outcomes such as NPD success (e.g., Cooper, 1984; Dougherty, 1987). However, much of the existing research on communication behaviours examines only one communication dimension i.e., communication frequency. Fisher et al. (1997) suggest that a thorough understanding of communication behaviours cannot be gained by measuring only communication frequency. Therefore, to better understand the effects of different communication behaviours, our research examines two communication dimensions – communication quality and frequency.

The context for our study is communication and organisational learning during NPD projects, because it is widely recognised that NPD is a source of competitive advantage for firms as it improves a firm's competitive position and strengthens their competitive advantage (Cormican and O'Sullivan, 2004). Moreover, research suggests that communication behaviours and organisational learning are two key factors that can impact on the effectiveness of the NPD process (e.g. Rama and Massey, 2007). The objective of this

research is therefore to test a conceptual model of the effects of communication quality and frequency on organisational learning dimensions (i.e. team orientation, systems orientation, memory orientation, and learning orientation).

Our research is theoretically important because it increases our understanding of how different communication behaviours can influence different organisational learning dimensions. This research is also managerially important as it can help managers responsible for NPD to understand how communication behaviours can affect organisational learning, thus allowing them to also implement appropriate strategies to improve NPD efforts.

Conceptual Framework and Hypotheses Development

Theoretical Framework

This research draws on social learning theory which emphasises “the prominent roles played by vicarious, symbolic, and self-regulatory processes in psychological functioning” (Bandura, 1977. p.vii). Moreover, social learning theory posits that the use of verbal symbols (e.g., communication) enables people to “process and preserve experiences in representational forms that serve as guides for future behaviour” (Bandura, 1977. p.13). This has direct implications for the link between communication and organisational learning because organisational learning is primarily concerned with the acquisition and transfer of knowledge in order to modify behaviour. Therefore, social learning theory implies that learning is facilitated by communication, and thus constitutes the central premise of our conceptual framework in this research (see Figure 1 below).

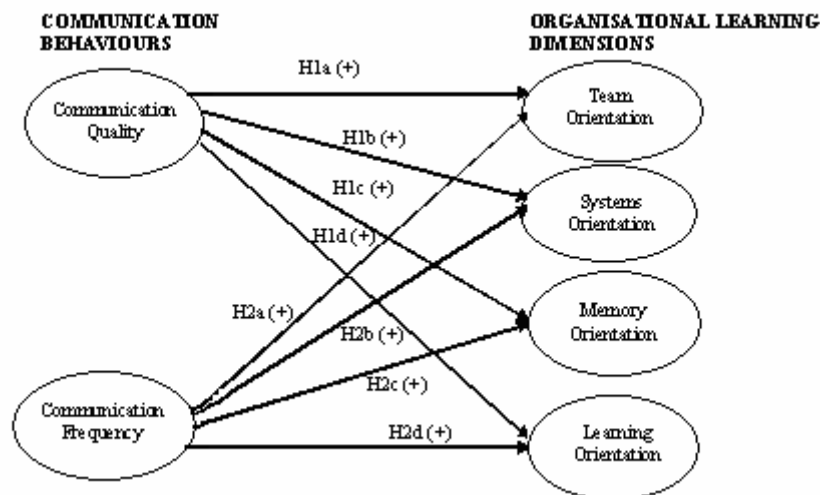


Figure 1: Conceptual Model

Organisational Learning Dimensions

Organisational learning can be viewed from four principal schools of thought, including an economic view, a developmental view, a managerial view, and a process view (Bell et al. 2002). This paper takes a process view since it includes the various learning dimensions that are common to all organisations, e.g., information acquisition, dissemination, and utilisation. Therefore, for the purpose of this research, organisational learning is defined as the ability of

an organisation to create, acquire, and transfer knowledge, and to modify the firm's behaviour to reflect the new knowledge learnt (Garvin, 1993).

Hult and Ferrell (1997) synthesised various studies of organisational learning to develop a number of orientations which underpin the global construct "organisational learning". These include team orientation, systems orientation, learning orientation, and memory orientation. Team orientation is concerned primarily with collaboration and cooperation in performing activities and making decisions. Systems orientation on the other hand, is concerned with seeing the broad picture of activities. Memory orientation emphasises communication and distribution of knowledge. Finally, learning orientation is the degree to which the long-term benefits of organisational learning are emphasised within the organisation.

The Effects of Communication Quality

Communication quality can be defined as the perceived relevance and usefulness of information supplied for the task at hand (Moenaert et al. 1992). Research by Fisher et al. (1997) suggests that a primary benefit of improving the quality of communication is that employees will tend to experience less uncertainty and fewer misunderstandings. This has specific implications for organisational learning. For instance, the fewer the misunderstandings occurring between employees, the greater the degree to which decisions are made on credible information. Moreover, both Menon et al. (1999) and Maltz and Kohli (1996) argue that the higher the quality of communication between employees, the more likely employees will trust each other. Consequently, this may stimulate collaboration and the distribution of knowledge between employees, thereby increasing organisational learning. Further support is provided by Argyris and Schon (1981) and Moenaert and Caeldries (1996) who suggest that by improving the quality of communication, firms can increase organisational learning. Based on this discussion, it can be hypothesised that:

H_{1a-d} The greater the communication quality during NPD, the greater the (a) team orientation, (b) systems orientation, (c) memory orientation, and (d) learning orientation.

The Effects of Communication Frequency

Communication frequency is defined here as the number of times information is transmitted by one manager to another during NPD (cf. Van de Ven and Ferry, 1980). Various studies suggest that different world views and language dissimilarities between employees can lead to divergence and conflict (Fisher et al., 1997; Griffin and Hauser, 1996). However, others argue that the more frequently employees communicate, the greater the collaboration (Sinkula et al. 1997). Moreover, Senge (1990) suggests that greater collaboration through frequent communication can result in "sharing assumptions, thinking together to solve problems, and chartering the future operations of the organization" (Hult and Ferrell, 1997. p.99). These are considered vital elements in fostering organisational learning. Therefore, we hypothesise:

H_{2a-d} The greater the communication frequency during NPD, the greater the (a) team orientation, (b) systems orientation, (c) memory orientation, and (d) learning orientation

Methodology

This research uses a sample of Marketing Managers in Australian firms which are involved in NPD. Using a sampling frame of $n = 229$, 98 respondents completed and returned the questionnaire, resulting in an overall response rate for this research of 42.8%.

This research used a total of six multi-item measures, one formative measure (communication frequency) and five reflective measures (communication quality, team orientation, systems orientation, memory orientation, and learning orientation). Measures were selected using Fornell and Larcker's (1981) criterion, which suggests that in order to avoid problems with convergent and discriminant validity, items with standardised loadings greater than 0.7 should be selected. In addition, items were also selected based on face validity.

To analyse the measurement and structural models, PLS Graph Version 3 was used because of its ability to model formative measures (communication frequency) and accommodate small sample sizes (e.g. $n = 98$). In addition, PLS is appropriate for this research as we make no assumptions about univariate or multivariate normality (Chin, 1998; Diamantopolous and Winklhofer, 2001; and Fornell and Bookstein, 1981).

To check for unidimensionality, principal component analysis (PCA) was conducted on each of the five reflective multi-item measures. PCA results revealed no cross-loadings and that the items were more correlated with its related construct, than any other model construct; thus satisfying Hattie (1985) and McDonald's (1981) criterion for unidimensionality. All of the measures were therefore adequate indicators of the latent variables, and no items were deleted from the measurement model. PCA results also eliminated common method variance as no single factor emerged from the analysis (Podsakoff, MacKenzie, Lee, and Podsakoff, 2003).

Convergent validity was achieved as the average variance extracted (AVE) of the five reflective measures was greater than 0.5 (Bagozzi and Yi, 2005). For instance, the AVEs for all reflective measures were between 0.63 and 0.87. Scale reliability was established as the composite reliability for each scale was above 0.7. For example, the composite reliability for communication quality was 0.90. Discriminant validity was established, since the square of the correlation between any pair of constructs was less than the AVEs of each individual construct (Fornell and Larcker, 1981).

Results and Discussion

The R^2 value for the organisational learning dimensions were all relatively high ranging from 0.457 to 0.275. Moreover, these results revealed that 45.7% of the variance in systems orientation is explained by communication quality and communication frequency.

Table 1: PLS Structural Model Results

Linkages in the Model	Hypothesis Number	Hypothesis Sign	Standardised Beta (t-value)	Model Statistics
CQ → TO	H _{1a}	+	0.544 (5.4152)***	R ² for TO = 0.439
CQ → SO	H _{1b}	+	0.501 (5.0037)***	R ² for SO = 0.457
CQ → MO	H _{1c}	+	0.291 (2.5950)**	R ² for MO = 0.275
CQ → LO	H _{1d}	+	0.479 (4.7946)***	R ² for LO = 0.324
CF → TO	H _{2a}	+	0.198 (1.7536)*	
CF → SO	H _{2b}	+	0.272 (2.8713)**	
CF → MO	H _{2c}	+	0.318 (3.5174)***	
CF → LO	H _{2d}	+	0.153 (1.6356)*	

* Sig. at ≤ 0.05 level (one-tailed test) ** Sig. at ≤ 0.01 level (one-tailed test)

*** Sig. at ≤ 0.001 level (one-tailed test)

As shown in Table 1 above, the results revealed that communication quality had a significant relationship with each of the organisational learning dimensions, thus supporting hypotheses H_{1a-d}. Furthermore, the results in Table 1 also reveal that communication frequency had a significant relationship with each of the organisational learning dimensions, therefore each of the four hypotheses linking communication frequency to organisational learning dimensions were supported, H_{2a-d}. Overall however, our results show that of the two communication dimensions, communication quality has the strongest and most wide ranging effects on organisational learning.

The results in Table 1 also revealed interesting results when the paired comparisons are examined. Overall, communication quality had a greater significant effect on the organisational learning dimensions, except in one instance (i.e. memory orientation). For instance, communication quality had a greater positive effect on team orientation ($\beta = 0.544$, t-value = 5.4152, $p \leq 0.001$) and learning orientation ($\beta = 0.479$, t-value = 4.7946, $p \leq 0.001$). This suggests that the higher the quality of communication the greater the collaboration and cooperation (i.e. team learning) and the greater the emphasis on the long-term benefits of learning will occur within the firm. In addition, communication quality had a greater effect on systems orientation ($\beta = 0.501$, t-value = 5.0037, $p \leq 0.01$). In contrast, communication frequency had a greater influence on memory orientation ($\beta = 0.318$, t-value = 3.5174, $p \leq 0.01$). This suggests that the more frequent communication occurs amongst employees within the firm the greater memory learning and thus the retention of information.

Our results have significant implications for managers and those involved in the NPD process. First, in order to promote organisational learning orientations within the firm, managers need to understand that this requires both an increase in communication quality and frequency, but quality of communication is the more important of the two.

Furthermore, managers need to also understand that there are different dimensions to organisational learning, and that different communication behaviours can have differential effects on these organisational learning dimensions. For example, to facilitate a team learning orientation during the NPD process, managers would need to focus on improving the quality of communication between those involved in the NPD process. In contrast, communication frequency is relatively ineffective in fostering a team learning orientation. Second, communication frequency should be accompanied by communication quality to foster organisational learning during NPD. This is consistent with Fisher et al's (1997) position that

measuring only communication frequency will not adequately capture the effects of communication on variables such as organisational learning.

Conclusions and Directions for Future Research

This research empirically tested the relationship between communication behaviours and organisational learning dimensions. The insights that can be drawn from this research are that both communication behaviours and organisational learning are important constructs that are significantly related to each other and thus deserve further investigation.

Limitations within this research include a relatively small sample size, and concentrating only on the effects of two communication behaviours organisational learning dimensions. Consequently, future research could employ a larger sample size and investigate other communication variables which have a direct effect on organisational learning dimensions, such as bidirectional communication.

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