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Original Research Article

A Study on the Factors Influencing the Performance of Teacher Teams in Colleges and Universities Under Deterministic Task Types

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Abstract: The purpose of this study was to investigate the effects of task goals, competition, and the way information is distributed on the performance of teacher teams in colleges and universities under deterministic task types. The results of the experiment conducted with 252 subjects showed that the completion of goals was quicker for goals at low levels with even distribution of information. In terms of contextual performance, members had a better understanding of perspectives when information was fully shared. In terms of contextual performance, members were more satisfied with their individual decisions when there was no competition. For goals at high levels, subjects completed goals more quickly without competition, and completed goals more quickly when information was fully shared. In terms of contextual performance, the presence or absence of competition and information distribution mode had no effect on any of the five dimensions.
Keywords: Team performance; Goals; Competition; Information distribution mode

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The increasingly complex external environment and the increasingly fierce competition in research and teaching faced by modern universities require universities to adopt more flexible, problem- and task-oriented organizational forms, and teams are an effective organizational form. Team performance is a description of the overall situation of team operation, which is affected by many factors inside and outside the team, and therefore there are various factors affecting team performance[1].

Goal theory, first proposed by Locke and others, argues that goals are associated with improved performance because they encourage morale, sharpen employees' focus, urge them to work harder and encourage them to maintain their efforts. They can also encourage employees to actively propose strategies [2]. However, there are few studies on whether there is any change in employees' performance for goals at different levels. So in this study, we selected three independent variables (team goals, intra-team competition, and information distribution modes) under deterministic task types to experimentally verify the effects on team performance of teachers in colleges and universities[3].

I. Research Methodology

(1) Research methods and tools

Combining the research questions and objectives of this paper, a two-factor completely randomized experimental design of 2 (presence or absence of intra-team competition) × 2 (information distribution mode) was chosen to be used at three different target levels. Finally, SPSS statistical software was used for analysis.

(2) Study design and definitions of variable operations

This study used a two-factor completely randomized experimental design of 2 (presence or absence of intra-team competition) × 2 (information distribution mode). The operational definition of intra-team competition in this experiment was that subjects were told that the total score for this task was 480 and that their goal was to achieve a score of 140 (30% of the total score) for Experiment 1, 240 (50% of the total score) for Experiment 2, and 480 (total score) for Experiment 3. No competition within the team was defined as the subjects were told that the total score for this task was 480 and that their goal was to achieve the team score. As for the information distribution mode, it is divided into two ways: fully shared information and evenly distributed information. Level 1 fully shared information means that each member has all the task information. Level 2 evenly distributed information means that each member has only a part of the task information, but the sum of information is the same as the fully shared information.

Team performance is used as the dependent variable, and team performance is divided into task performance and contextual performance. For task performance in this experiment, we use the team's time to complete the goal (accurate to the second) as a measuring standard.

2. Findings

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2.1 Effect of the presence or absence of competition and the information distribution mode within the team on team performance for goals at low levels

The purpose of the experiment was to investigate whether the presence or absence of competition and the information distribution mode within a team has a significant effect on team performance under a deterministic task type for goals at low levels (goal setting was the 30% of the total score).Analysis of variance of the effect of two factors on the time to complete the goals at low levels

(1) Analysis of variance for two-factor independent samples

It was found that there was a significant difference between the information distribution mode and the time to complete the goal at the 0.01 level. And the subjects completed the goal more quickly in the case of even information distribution (M= 519.000) than in the case of fully shared information (M= 647.000). Whereas there was no significant difference between the presence or absence of competition and the time to complete the goal, and there was an interaction between the presence or absence of competition and the information distribution mode.

(2)Interaction analysis between presence and absence of competition and the information distribution mode on the completion time of the goal

Since there was an interaction between the presence or absence of competition and the information distribution mode, a further simple effect analysis was performed. The results showed that with even distribution of information, there was a significant difference between the presence and absence of competition on the time to complete the goal at the 0.01 level, $F=17.051$, $p=0.003$, $p<0.01$. That indicated that when the information was evenly distributed to the subjects, the time to complete the goal was shorter in the case of no competition (M=433.667, SD=29.396) than in the case of competition (M= 605.333, SD=29.396). With fully shared information, there was a significant difference between the presence and absence of competition on the time to complete the goal at the 0.01 level, $F=23.610$, $p=0.001$. That indicated that with fully shared information, subjects in competition (M=546.000, SD=29.396) completed the goal more quickly than without competition (M=748.000, SD= 29.396).

With competition, there was no significant difference in the effect of information distribution mode on the time to complete the goal, $F=2.037$, $p=0.191$, $p>0.05$. In the condition without competition, there was a significant difference in the effect of information distribution mode on the time to complete the goal at the 0.001 level, $F=57.170$, $p=0.000$, $p<0.001$. That indicated that in the condition without subject competition, subjects with the evenly distributed information (M=433.667, SD=29.396) condition completed the goal much more quickly than subjects with the fully shared information (M=748.000, SD=29.396)

(3) Contextual performance

The analysis revealed that there was a significant difference ($p<.05$) between the group with evenly distributed information and the group with fully shared information from the perspective of contextual performance. Thus, members' understanding of opinion is better under the condition of fully shared information than in the condition of evenly distributed information. While there is no significant difference between the two groups in the satisfaction with group decision making, team satisfaction, ease of expressing viewpoints, and satisfaction with individual decision making.

2.2 The influence of intra-team competition and information distribution mode on team performance for goals at middle levels.

To investigate whether the presence or absence of intra-team competition and information distribution mode has a significant effect on team performance in the deterministic task with a goal at the middle level (goal setting was the 50% of the total score).

(1) Analysis of variance results for two-factor independent samples

The results revealed that the presence or absence of competition had a significant influence on the time to complete the goal at the 0.05 level, and subjects completed the goal more quickly with competition (M= 639.333) than without competition (M= 740.000). There was a significant difference between the information distribution modes and the time to complete the goal at the 0.01 level, with subjects completing the goal more quickly with fully shared information (M= 599.000) than with evenly distributed information (M= 780.333). There was no interaction between the presence or absence of competition and the information distribution modes.

(2) Contextual performance

The analysis revealed that there was a significant difference between the group with competition and the group without competition in the contextual performance of individual decision satisfaction ($p<.05$). Thus, members' satisfaction with individual decision making was higher in the condition of no competition than in the condition of competition. There were no significant differences between the group with evenly distributed information and the group with fully shared information on any of the five dimensions of the contextual performance. These five dimensions were satisfaction with group decision making, satisfaction with team, ease of expressing opinions, understanding of opinion, and satisfaction with individual decision making.

2.3 The effect of competition and information distribution on team performance for goals at high levels

To investigate whether the presence or absence of competition and the information distribution mode in the team had a significant effect on team performance under a deterministic task (as in Experiment 1) with a goal at a high level (goal setting was the total score).

(1) Analysis of variance results for two-factor independent samples

The results revealed that there was a significant difference between the presence or absence of competition and time to complete the goal at the 0.05 level, with subjects completing the goal more quickly without competition (M= 1035.833) than with competition (M= 1176.500). There was a significant difference between the information distribution mode and the time to complete the goal at the 0.001 level, with subjects completing the goal more quickly with fully shared information (M= 940.333) than with evenly distributed information (M= 1272.000). There was no interaction between the presence or absence of competition and the information distribution mode.

(2) Contextual performance

The analysis revealed that there were no significant differences between the groups with and without competition on any of the five dimensions of the contextual performance. These five dimensions were satisfaction with group decision making, satisfaction with team, ease of expressing opinionss, understanding of opinions, and satisfaction with individual decision making. There were no significant differences between the group with evenly distributed information and the group with fully shared information on any of the five dimensions of the contextual performance. These five dimensions were satisfaction with group decision making, satisfaction with team, ease of expressing opinions, understanding of opinion, and satisfaction with individual decision making.

3. Conclusion

3.1 The influence of the presence or absence of competition in the team and the information distribution mode on team performance for goals at low levels.

The information distribution mode had a significant effect on the time to complete the goal, with subjects completing the goal more quickly when information was evenly distributed than when information was fully shared. The intellectual source limitation theory of attention suggests that attention is a very limited mental resource, and when more resources are allocated to perform one task, the assignment is improved. But other tasks are limited by the intellectual source, which affects the efficiency of completing the task. With fully shared information, the task was hindered by subjects paying too much attention to other people's information, resulting in a situation where with fully shared information the goal was not accomplished as quickly as with evenly distributed information[4].

There was an interaction between the presence or absence of competition and the information distribution mode in terms of the time to complete the goal. A simple effect analysis of the interaction showed that when information was evenly distributed, subjects completed the goal more quickly in the condition of no competition than in the condition of competition. In that case, each subject had his or her own task information and could not see others', so that he or she could concentrate and complete his or her task without interference. And because the level of the goal was relatively low, he or she completed the task more quickly. With fully shared information, it took more time for subjects to complete the goal with competition than without competition. In that case, subjects had the pressure of competition and knew what other people's tasks were. At the same time, teachers in colleges and universities had active thinking and strong logical capability, so they could integrate various resources to complete the goal quickly by knowing both themselves and their adversaries. Without competition, subjects with the evenly distributed information completed the goal much more quickly than with completely shared information. In this case, there was no competition within the team, everyone had a common goal and could work together for the goal. At the same time, the information is evenly distributed so that everyone can spend less time processing the information and thus have more time to complete the task, improving the efficiency of accomplishing the goal.

3.2 The influence of the presence or absence of competition and the information distribution mode in the team on team performance for goals at middle levels

Statistical analysis of the experimental results showed that the presence or absence of competition had a significant effect on the time to complete the goal, and subjects completed the goal more quickly in the presence of competition than in the absence of competition. The information distribution mode also had a significant effect on the time to complete the goal, with subjects completing the goal more quickly with fully shared information than with evenly distributed information.

In this study, the goal setting was to complete fifty percent of the overall task, making the task relatively more difficult compared to the first experiment. In that case, it took more time to complete the goal, thus creating the competitive atmosphere. The atmosphere of competition puts pressure on everyone to complete the task, stimulates their potential to a certain extent, sharpens their attention on working and improves their efficiency in completing the task, because everyone is burdened with the possibility of being punished, and no one wants to perform a show in front of the crowd because of dereliction of duty.

The information distribution mode had a more significant effect on the time to complete the goal in this experiment. Unlike Experiment 1, the group with fully shared information completed the goal more quickly than the evenly distributed group. What's the reason behind that? In the condition of even distribution of information, each member has incomplete information. And they need to integrate the information before taking action, which increases the time to fulfill the goal. The subjects in the group with fully shared information have a comprehensive understanding of their own and others' tasks, and they will be more likely to enter the state than the subjects in the group with evenly distributed information. In the state of knowing both themselves and their adversaries, it is easier for people to cooperate and make a reasonable division of labor in order to accomplish the goal to the greatest extent possible, so as to complete the task effectively.

3.3 The influence of the presence or absence of competition and the information distribution mode in the team on team performance for goals at high levels

Statistical analysis of the experimental results showed that the presence or absence of competition had a significant effect on the time to complete the goal, and subjects completed the goal more quickly in the absence of competition than in the presence of competition. There was a significant difference at the 0.001 level between the information distribution mode and the time to complete the goal, with subjects completing the goal more quickly with fully shared information than with evenly distributed information.

The goal setting for this experiment was higher compared to the previous two experiments, and it was to accomplish all the tasks, which put a lot of pressure on the team. This pressure was invariably increased when combined with the presence of competition. The stress performance model showed that there was a relationship between stress and job performance that could be explained by the inverted U model. According to the theory of the inverted U model, when the sense of stress is below a moderate level, it helps to stimulate the organism and enhance the organism's reaction capacity. Then the individual will work better and more quickly and the individual will have more enthusiasm for work. If too much pressure is imposed on the individual and too many demands and restrictions are placed on the individual, the performance of the individual will be weakened.

The information distribution mode had a significant effect on the time to complete the goal at a high level, with the fully shared group completing the goal much more quickly than the evenly distributed group. In the information-sharing approach, subjects tend to take all information into account and make choices according to the same weighting, which in turn improves the quality of decision making. Therefore, in the case of a heavy information load, a fully shared distribution of information can improve the efficiency of the team in completing the task than the evenly shared distribution of information.

References:

[1] John M. Tauer, Judith M. Harackiewicz. The Effects of Cooperation and Competition on Intrinsic Motivation and Performance. Journal of Personality and Social Psychology， Volume 86， Issue 6， June 2004， Pages 849-861

[2] Tim Wildschut， Chester A. Insko， Lowell Gaertner. Intragroup Social Influence and Intergroup Competition. Journal of Personality and Social Psychology， Volume 82， Issue 6， June 2002， Pages 975-992

[3] Li lisha, Zhang qinglin. Goal-setting theory and human resource management, Journal of Chongqing University, 2006, 12, 64-70

[4] Shao Quanhui, Chen, Xile. An analysis of goal-setting theory in scientific research organizations, Studies in Dialectics of Nature, 2006, 73-76.

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