The Impact of Team Diversity on Design Performance

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Background

Today's works are often completed in a team, organizational performance can be improved through team cooperation, communication and coordination. However, the personality diversity of team members will affect team performance and may have positive or negative impacts. The results of past research are inconsistent, so the relationship between team personality diversity and performance may be affected by the moderator factors.

This study investigated the effects of team personality diversity on design performance, and use team relation-oriented diversity as moderator. In this research, the variables that measure the team relation-oriented diversity include gender diversity, diversification of birth order, and diversification of family socioeconomic status. And the diversity of personality traits includes five major personalities- neuroticism, conscientiousness, openness to experience, extraversion and agreeableness. The dependent variable, the performance of the design team, was measured by whether the teams advance to the semifinal or not.

Methods:

This study is divided into two phases for mixed-methods research. The first phase is quantitative research, which explores the relationship between team personality trait diversification and design performance, and relationship-oriented diversification as moderator. And the second phase is a qualitative research, which explores the special features of the 17 teams which was advance to the final competition.

Participants

The sample of this study is based on the “Design Competition” holding in Taiwan. Participants are required to fill out the questionnaire when registering online.

The first phase of the sample is based on the participants who signed up for the preliminary competition. After sorting the data, there are 319 people grouping into 171 teams, deleting the invalid questionnaire and single participants, there are 148 teams was composed of 296 team members, the valid response rate is 92.7%.

The second phase, there are 17 teams, a total of 32 people, and the data is collected in first phase.

Procedure and measurement instruments

Participants are required to fill in the basic information (gender, social status, birth order, etc.) and the personality inventory when registering.

There are 50 questions in personality inventory, and team personality diversity is calculated by variances and the averages of the personality traits of the two members.

Team relation-oriented diversity includes gender diversity, diversification of birth order, and diversification of family socioeconomic status.

The calculation of gender diversity is based on Blau (1977). The higher the calculated value, the greater the heterogeneity. The diversification of birth order and the diversification of socioeconomic status are calculated by the averages of the two members.

Results

Quantitative study

After the logistic regression analysis, we found that team personality diversity (measured in average) affects design performance.(see table 1) The β value of the extraversion diversity is -0.101 ($P<0.05$), indicating an increase in the average level of the team's extraversion personality traits will reduce the chances of advancing to the next step of the competition.

Table 1. The impact of team personality diversity on design performance

Variable (measured in average)	N=148 Dependent variable：Design performance
Independent variable	β
Conscientiousness diversity	0.024
Neuroticism diversity	-0.007
Agreeableness diversity	0.056
Extraversion diversity	-0.101*
Openness to experience diversity	0.068
Omnibus test	X^2=9.849+
Cox & Snell R^2 =0.064, NagelkerkeR^2=0.086	

Next is to verify the impact of team relation-oriented diversity on design performance (see table 2). First, the β value of gender diversity is -2.414 ($P<0.05$), indicating that team performance will be negatively affected when the gender differences of team members are large. Second, diversification of birth order has no significant impact on design performance.

Finally, the β value of socioeconomic status diversification is 0.036 ($P<0.10$), indicating that team performance will be positively affected by the average level of socioeconomic status of team members.

Table 2. The impact of team relation-oriented diversity on design performance

Variable	N=148 Dependent variable：Design performance
Independent variable	β
Gender diversity	-2.414*
Diversification of birth order	0.072
Diversification of socioeconomic status.	0.036+
Omnibus test	X^2=9.642*
Cox & Snell R^2 =0.063, Nagelkerke R^2=0.084	

Qualitative study

There were only 17 teams, 32 people (two groups are single players), advances to the final competition (see table 3). There are 16 agreeableness members accounted for 50% of the 32 people in the final stage. And there were 195 agreeableness members, accounting for 65.9% of the total sample of 296. After comparing the above ratios, we found that agreeableness personality traits do not positively affect performance.

There are 6 openness to experience members accounted for 18.75% of the 32 people in the final stage. And there were 109 openness to experience members, accounting for 36.8% of the total sample of 296. After comparing the above ratios, we found that openness to experience personality traits do not positively affect performance.

The average score of the socioeconomic status in the final stage is 34.47, which is higher than the average of total sample (32.14). We infer that socioeconomic status will affect design performance.

There are 24 groups of the opposite sex and 124 groups of the same sex, accounting for 16.2% and 83.8% of the total sample. Only one team is heterosexual and 16 same sex, accounting for 5.8%, 94.1%, in the final stage. We infer that the design performance of the same-sex group is better than the heterosexual group.

20 of the members are the eldest son at home, accounting for 62.5% of the final stage. And 48.3% of the total sample is the eldest son. We infer that the eldest son will lead to better performance.

Table 3. Qualitative study form

Team	Personality Traits (Big-Five)		Socioeconomic status		Gender		Birth order		Notes:
	P1	P2	P1	P2	P1	P2	P1	P2	*Personality Traits:* N(neuroticism) C(conscientiousness) O(openness to experience) E(extraversion) A(agreeableness) *Socioeconomic status:* Score of the status (rank of the status), the higher the score , the better the socioeconomic status *Birth order:* 1(eldest), 2(the second)…
1	A	N	26(4)	26(4)	F	F	2	3	
2	A	A E	44(2)	51(2)	F	F	1	1	
3	E	--	48(2)	48(2)	M	M	1	1	
4	A	--	26(4)	26(4)	F	M	1	2	
5	A	E	33(3)	19(4)	F	F	1	1	
6	O	--	33(3)	19(4)	M	M	1	1	
7	A	A	23(4)	30(3)	F	F	3	1	
8	A\O	--	48(2)	33(3)	M	M	1	2	
9	A	A	44(2)	40(3)	F	F	1	2	
10	E	A	26(4)	37(3)	M	M	1	1	
11	C	A\C	40(3)	47(2)	M	M	1	1	
12	O	N	51(2)	55(1)	M	M	1	1	
13	O	E	26(4)	37(3)	M	M	3	1	
14	A\C\O	A	26(4)	23(4)	F	F	2	4	
15	O	A	33(3)	26(4)	F	F	1	3	
16	C	--	33(3)	--	F	--	2	--	
17	A\C	--	26(4)	--	F	--	2	--	

Conclusion

Quantitative study

(1) The average level of team extroversion has a significant negative impact on design performance. (2) Gender diversity of team members has a negative impact on design performance. (3) The diversification of family socioeconomic status was positively related to the design performance.

Qualitative study

(1) The socioeconomic status of team members will positive impact performance. (2) The design performance of the same-sex group is better than the heterosexual group. (3) The birth order has a positive impact on design performance.