DYNAMICS OF TEAM WORKING AND PROJECT SUCCESS RELATIONSHIP: PLS-SEM METHOD APPLICATION IN SMALL SAMPLE SIZE

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PROBLEM IDETIFICATION

- This research attempted to demystify the underlying dynamics behind the success of project teams.

- The role commitment to learn in the effect of evaluation and rewards which is one of the sub-dimensions of team work on project success was examined.

- Commitment to learn is one of the sub-dimensions of organizational learning.

- This dimension particularly reflects the view of the top management towards the learning concept.

- Although rewarding is influential on project success just that is not enough to increase the project success.
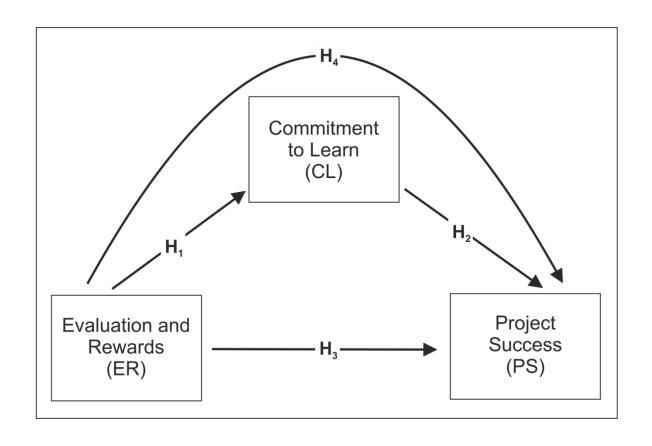
PROBLEM IDETIFICATION

- Core hypothesis of this research put forward the premise that the success can be increased by enabling employees to improve themselves and attaching importance to the learning.

- This research has sample size limitation because it was applied on R&D teams.

- For this reason, PLS-SEM analysis method which is preferred in the literature in low sample size was used.

CONCEPTUAL MODEL

HYPOTHESES

H$_1$: Evaluation and Rewards has a positive effect on Commitment to Learn.

H$_2$: Commitment to Learn has a positive effect on Project Success.

H$_3$: Evaluation and Rewards has a positive effect on Project Success.

H$_4$: Commitment to Learn has mediator role in the effect of Evaluation and Rewards on Project Success.

Commitment to Learn

- Commitment to learn is one of the sub-dimensions of organizational learning. It particularly reflects the view of the top management towards the learning concept.

Evaluation and Rewards

- Evaluation and rewards is one of the sub-dimensions of team work and refers to evaluation of team members and rewards them according to their performance.

Project Success

- Project success is not solely about the delivery of the final project results, which are in alignment with the project vision. The project success criteria vary according to the content of the project.

MEASURES AND SAMPLING

- The scale adopted from prior studies were used to measure the dimensions.

- The scales adopted by Levi, D. and Slem, C. were used to measure Evaluation and Rewards.

- The scale adopted Calantone, R.J, Çavusgil S.T, Zhao, Y. were used to measure Commitment to Learn.

- The scale adopted from Cooper, R. G., & Kleinschmidt, E. were used to measure Project Success.

- The data was collected through face to face survey. The sample of the research consists of 72 people.

- Sample subjects are the employees working in R&D departments.

RESEARCH METHODS

- In this research quantitative data was used and five point Likert scale survey was conducted.

- Confirmatory factor analysis (CFA) was used to analysis of the convergent validity. In order to assess discriminant validity, average variance extracted values (AVE) were calculated.

- Cronbach alpha and composite reliability (CR) values were found to analyse the reliability of the scales.

- Structural equation model which is a multi-variable statistical method was used to test the hypotheses put forward in the conceptual model.

- PLS-SEM analysis method was used.

- Smartpls statistics programs were used for analyses.

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CONFIRMATORY FACTOR ANALYSIS

Variables	Items	Standardized Factor Loads
Evaluation and Rewards (ER)	ER0610	0.744
	ER0509	0.883
	ER0408	0.889
	ER0307	0.889
	ER0206	0.735
Commitment to Learn (CL)	CL0458	0.893
	CL0357	0.884
	CL0256	0.904
	CL0155	0.862
Project Success (PS)	PS0841	0.826
	PS0740	0.812
	PS0639	0.745
	PS0538	0.843
	PS0437	0.880
	PS0336	0.803
	PS0235	0.884
	PS0134	0.757

$p < 0.05$ for all items

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CONFIRMATORY FACTOR ANALYSIS

- After the data purification process 17 items were included in the confirmatory factor analysis.

- Confirmatory factor analysis was performed on the scales by using smartpls for assessing convergent validity .

- According to the confirmatory factor analysis results, the standardized factor loads of each item are larger than 0.5.

- These results confirmed the convergent validity of the scales.

CONSTRUCT DESCRIPTIVES, CORRELATION AND RELIABILITY

Variables	1	2	3
1.Evaluation and Rewards	(.831)		
2.Commitment to Learn	.737*	(.886)	
3.Project Success	.410*	.517*	(.820)
Composite reliability	.917	.936	.942
Average variance ext.	.691	.785	.673
Cronbach α	.886	.908	.929
Mean	3.12	3.53	3.27
Standard Deviation	0.89	0.84	0.62

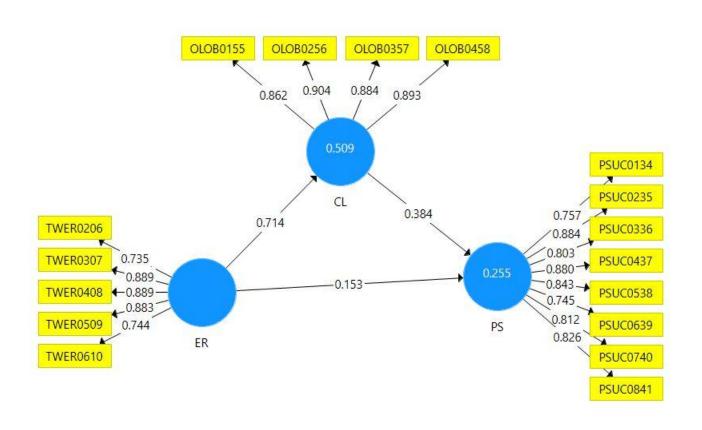*$p < 0.05$

Note: Diagonals show the square root of AVEs.

CONSTRUCT DESCRIPTIVES, CORRELATION AND RELIABILITY

- To assess discriminant validity, average variance extracted values were calculated. Results are close to or beyond the threshold level (i.e. 0.5)

- Reliability of each construct individually calculated. Composite reliability and Cronbach α values are close to or beyond the threshold level (i.e. 0.7).

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- The mediator analyses were conducted according to Baron and Kenny method (Baron & Kenny, 1986). According to this method, firstly, correlations among the variables should be verified (Baron & Kenny, 1986). Correlations among the variables are significant as shown in the Table 2. To test the hypotheses below 3 models developed:

Model 1: $PS = \beta_0 + \beta_1.ER + €$
Model 2: $CL = \beta_0 + \beta_2.ER + €$
Model 3: $PS = \beta_0 + \beta_1.ER + \beta_2.CL + €$

HYPOTHESES TEST RESULTS

Relationships	Model 1	Model 2	Model 3
Evaluation and Rewards (ER) → Project Success (PS)	0.436*		0.153
Evaluation and Rewards (ER) → Commitment to Learn (CL)		0.717*	
Commitment to Learn (CL) → Project Success (PS)			0.384*

Note: Path coefficients are standardized
*p < 0.01

R2 (Explained Variance)

- In PLS-SEM, the most used measure to assess the path models is the coefficient determination (R2). R2 value indicates the predictive power of the model and refers to combined effects of exogenous latent variables on an endogenous latent variable and represents the amount of variance explained (Hair, Hult, Ringle, & Sarstedt, 2017). There is rule of thumb for acceptable value of R2. Above 0.20 R2 value can be considered as high. For this study, the values in below Table can be considered as acceptable.

Variables	R^2
Commitment to Learn (CL)	0.509
Project Success (PS)	0.255

f² (Effect Size)

- Effect size f2 is a measure of the impact of a construct on another. It is calculated by omitting the construct from the model. Effect size f2 represents the change in R2 when a construct omitted from the model. To assess f2, following values of 0.02, 0.15 and 0.35 are used. These values represent respectively, small, medium and large effects (Cohen, 1988).

Relations	f²
ER → CL	1.038
CL → PS	0.097
ER → PS	0.015

Q2 (Predictive Relevance)

- This value is also called as Stone-Geisser's Q2 value (Geisser, 1974). Q2 values are calculated for dependent variables in the model and indicate predictive relevance of path model for a dependent variable specifically. To calculate Q2 values, blindfolding procedure is used. Q2 values larger than 0 indicate that the model has predictive relevance for a certain dependent variable. Conversely, values of zero or below indicate lack of predictive relevance. In below Table, Q2 values of each construct are shown.

CL	0.361
PS	0.145

CONCLUSION

- As shown in above Table, H_4 is suppoted. Because after CL was included into the model relationship between ER and PS considerable decreased and turned into insignificant.   According to the results it can be said that CL mediates the relationship between ER and PS.

THANKS