Effects of Digital Training and Big Data Utilization on Innovation Creation in MSMEs by SECI Model

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Abstract. The paper uses the method of quantitative study to investigate the effect of SECI model on the innovation ability of employees. The results show that (1) the digital training has positive influence on the innovation capacity of the staff; (2) the use of large data has a positive effect on the innovation capacity of the staff. This research can be used as a reference for the study of employee's innovative ability, and it is significant to improve the innovation ability of the company. The findings are of great value to managers and researchers of MSMEs, and may guide the development of more efficient strategies to improve the performance of enterprises.

Keywords: SECI model application, Digital training, big data technology, employee innovation ability, innovation performance

1 Introduction

In an age of rapid technological development, Micro, Small and Medium Enterprises rely more on their innovative capacity. Through technical innovation, organizations can improve their innovative capacity and improve their innovative capability [1]. MSMEs continue to seek innovative ways to enhance their overall innovation level. The results show that the competitiveness of MSMEs is associated with sustainability, information awareness, and open innovation in networks [2]. In the process of technology transformation, the SMEs have higher demands on the innovation ability of the staff [3]. Highly innovative employees can help MSMEs to implement the digital transition rapidly. The improvement of the innovation capacity of MSMEs is conducive to the innovation and development of the whole.

2 Theoretical analysis and hypothesis development

Hypothesis 1: Knowledge socialization in digital training has a positive impact on employees' innovation ability. **Hypothesis 2:** The process of knowledge externalization in digital training has a positive impact on employees' innovation ability. **Hypothesis 3:** Knowledge internalization in digital training has a positive effect on employees' innovation ability. **Hypothesis 4:** Digital training positively affects employ-

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ees' innovation ability **Hypothesis 5:** The knowledge combination process in the use of big data has a positive effect on employees' innovation ability. **Hypothesis 6: T**he process of knowledge internalization in the utilization of big data positively affects employees' innovation ability. **Hypothesis 7:** Big data utilization positively affects employees' innovation ability

3 Research Method

SPSS software was used for data analysis and interpretation. The data includes variables such as employees' innovation ability (dependent variable), SECI model application (independent variable), and Digital training and big data utilization (intermediary variable). In the part of quantitative analysis, statistical analysis software is used to make descriptive statistics. Through questionnaire survey, 426 valid sample data were collected, and reliability analysis and factor analysis were carried out to test the direct and intermediary effects of the model and predict the fitting of the model.

These are China MSMEs, which include production, service, IT/IT, logistics and transportation. Some people proposed an appropriate Maximum Likelihood: ML sample size above 400, and Some people recommended that at least ten specimens were employed for analyzing the structure equation model. So, there were 426 participants in this study.

4 Results and findings

4.1 Construct reliability and validity

Reliability test.

In the reliability test, Cronbach's alpha factor is above 0.7, which is generally regarded as a good reliability, which shows that the scale has a good inner consistency and can be used to measure the measured structures. Among them, Cronbach's alpha for digital training is 0.887, big data utilization is 0.858, socialization is 0.801, externalization is 0.840, combination is 0.833, internalization is 0.851, and innovation ability is 0.821.

Validity test.

The KMO is 0.905, above the standard of high-moderation of 0.8. This experiment uses Chi-Square statistical method to measure the difference of correlation matrix and identity matrix. The Bartlett Test P was less than 0.05, and the results showed that there was a remarkable relationship between them, so it could be applied to the factor analysis. The P of Bartletts the Bartlett ball test was close to 0.05, which showed that the correlation matrix was significantly different from the identical matrix. The results show that these data are fit to be used in factor analysis (Table 1).

Table 1. KMO value and Bartlett sphericity test

KMO value		0.905
Bartlett sphericity test	Approximate chi-square	5901.294
	df	435
	p value	0.000

4.2 Structural model and hypotheses testing

It is found that the digital training and the use of large data have a significant positive impact on the three dimensions of knowledge management (socialization, externalization, integration, internalization) and innovation capability [4]. As shown in Hypotheses 1, 2, and 4, digital training has significant positive effects on social interaction (standardization factor = 0.394, $P < 0.001$), interaction with other people (standardization factor = 0.378, $P < 0.001$), and proposed new ideas (standardization factor = 0.218, $P < 0.001$). Large data also indicated that the combination (standardization factor = 0.594, $P < 0.001$), internalization (standard factor = 0.295, $P < 0.001$), and innovative capability (standard factor = 0.171, $P = 0.016$) [5]. Hypotheses 5, 6, and 7 were proved. Moreover, knowledge externalization, integration and socialization also had significant positive influence on innovative ability. The standard index was 0.253 ($P < 0.001$), 0.165 ($P = 0.011$), and 0.236 ($P < 0.001$) (Table 2).

Table 2. The path regression coefficient and statistical test table of the model are studied

Latent variable path relationship	Nonnormalized coefficient	Standardization coefficient	S.E.	C.R.	P
Socialization<---Digital training	0.337	0.394	0.052	6.485	***
Externalization<---Digital training	0.38	0.378	0.058	6.534	***
Combination<---Big data utilization	0.603	0.594	0.064	9.459	***
Internalization<---Big data utilization	0.344	0.295	0.067	5.135	***
Innovation ability<---Big data utilization	0.165	0.171	0.069	2.408	0.016
Innovation ability<---Digital training	0.195	0.218	0.056	3.47	***
Innovation ability<---Externalization	0.225	0.253	0.049	4.607	***
Innovation ability<---Combination	0.156	0.165	0.062	2.536	0.011
Innovation ability<---Socialization	0.246	0.236	0.06	4.124	***
Innovation ability<---Internalization	0.057	0.069	0.042	1.373	0.170

Note: *** means P<0.001, ** means P<0.01, * means P<0.05

5 Conclusion

First, the general conclusion is that digital training and big data utilization are helpful to enhance employees' innovation ability. This conclusion provides support for the digital training businesses should focus on the processes of knowledge externalization, socialization, and internalization when conducting digital training for their employees. employees.

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