Navigating Digital Transformation: Leadership Competence, Digital Capability, and Social Media Adoption in Extracurricular Training Institutions in China

Xiaoyu Huang[1,a]*, Alireza Mohammadi[2,b], Amer Hamzah Jantan[3,c]

huangxiaoyu@nsu.edu.cn[a],alireza.mohammadi@city.edu.my[b],amer.hamzah@city.edu.my[c]

City Graduate School, City University Malaysia,Kuala Lumpur, Malaysia[123]
Chengdu Neusoft University, Chengdu, China[1]

Abstract. Amidst China's education burden reduction policies and the digital technology wave triggered by COVID-19, extracurricular training companies are undergoing unprecedented transformations. Despite the crucial importance of leadership for the competitiveness of training institutions, its impact remains incompletely validated in the context of digital transformation. This study aims to explore the influence of leadership competence, digital capability, and social media adoption on the competitiveness of extracurricular training organizations in the digital era. Through literature review, establishment of a variable model, and quantitative analysis with 458 valid responses, data analysis was conducted using SPSS and SmartPLS software. The research findings provide valuable insights into how leadership competence, digital capability, and social media adoption impact the digital transformation competitiveness of extracurricular training institutions under restrictive conditions.

Keywords: Education burden reduction policies; Digital transformation; Leadership; Competitiveness

1 Introduction

In China, the academic pressure faced by primary and secondary school students has given rise to a thriving ecosystem of extracurricular training institutions（ETI）. The rapid expansion of these institutions prompted regulatory authorities to enact industry constraints, notably the "Double Reduction Policy" (DRP) introduced in July 2021. The DRP aimed to alleviate academic burdens, regulate the scale and intensity of ETI, and standardize their operational practices.

The impact of the DRP on ETI is profound, compelling leaders of various-sized training institutions to make strategic decisions in response to the new policy landscape. These decisions ranged from closures and suspensions to mergers or strategic transformations. A landscape survey conducted on the number of institutions before and after the implementation of the DRP revealed a noteworthy transformation.

Prior to the DRP, China boasted 490,000 education and training enterprises. Post-implementation, data from the Chinese Ministry of Education indicated an 83.8% reduction in

MSIEID 2023, December 08-10, Guangzhou, People's Republic of China

DOI 10.4108/eai.8-12-2023.2344716

offline off-campus training institutions and an 84.1% decrease in online off-campus training institutions. Remarkably, by July 2023, industry data reported on enterprise inspections showed that the number of educational and training institutions had surged to over 800,000. Despite DRP limiting financing and enterprise scale, the industry experienced significant growth in quantity. This prompts a critical inquiry: has digitization been a catalyst for the transformation of training institutions?

The questions at the forefront of this research delve into the intricacies of leadership competence(LC),digital capability(DC) and social media adoption(SMA) within extracurricular training institutions and their impact on firm competitiveness(FC). Specifically, the study seeks to understand if the LC of these institutions influences their FC. Furthermore, it explores whether DC and SMA acts as mediators between LC and FC.

This study aims to build a variable model for quantitatively analyzing the relationships among leadership competency (LC), digital capability (DC), social media activity (SMA), and firm competitiveness (FC). We also anticipate discovering new and impactful information during the questionnaire collection process that may influence our understanding of FC within the study context.

The innovation of this research lies in its fusion of leadership and the digital era, providing theoretical insights to support the extracurricular training industry's transformation amidst new regulations and digital developments. Utilizing a dynamic mindset, we aim to refine the construction of the FC model, offering comprehensive insights into the complex relationships between leadership, digital capability, social media activity, and firm competitiveness.

2 Literature review

Faced with the DRP, leaders of extracurricular training institutions have adopted different strategies to adapt to the new policy and digital background. Below, the research establishes a theoretical framework for competitiveness in leadership competence, digital capability, and social media adoption through literature review:

2.1 The Importance of Leadership in the Digital Era

The advent of Industry 4.0 has instigated a profound digital transformation across diverse sectors. It is imperative to recognize that this transformation extends beyond mere technical aspects, ushering in pivotal changes in company processes and organizational structures. Notably, it has given rise to a paradigm shift in leadership approaches.In this context, "digital leaders" emerge as key figures who must navigate swiftly and adapt to the dynamics of networked and distributed organizational frameworks. Their responsibilities extend beyond agility; they are tasked with effectively steering the entire organization through the complexities of digital transformation. It's essential to acknowledge that, given the early stages of this transformation for many companies, there is a lack of consensus and standardized models for digital leadership.[1]In contrast to conventional leaders, digital leaders possess distinct capabilities and outlooks. In the emerging digital era, the significance of digital leadership lies in its pivotal role for organizations to adapt and overhaul their business strategies, ensuring survival and relevance [2].

2.2 Digital Capability and its Application in Organizational competitiveness

The landscape of industries is undergoing a profound reshaping, driven by the transformative power of digital capabilities (DC). A comprehensive review of literature reveals a prevailing perspective among authors, characterizing digital capability as a composite framework encompassing elements such as knowledge, skills, and attitudes. This holistic view underscores the multifaceted nature of digital capability, highlighting its role in facilitating and driving transformation across various sectors.[3]. In today's digital landscape, the ability to identify opportunities facilitated by digital technology has become an essential element for maintaining competitiveness[4].There seems to be a discernible impact of digital culture and the proficiency of employees on the correlation between digital leadership and the sustained performance of organizations in South Korea.[5].

2.3 Relationship Between Social Media Adoption and Competitiveness

Firm competitiveness(FC) is the dependent variable of this study. Within the construction sector, the assessment of competitiveness is conducted across four tiers: national, sector-specific, individual enterprise, and project-specific. This research centers on the organizational level [6].Social media has the potential to bolster consumers' trust in companies by facilitating online communication, thereby amplifying the competitiveness of small and medium-sized enterprises (SMEs) [7].Social media is a competitive tool that influences competitiveness through imitation and product development, and can influence practices within organizations to form social media strategies[8]

3 Methods

This study employs a quantitative analysis approach, utilizing a questionnaire to gather research data. A Likert-type scale comprising 5 points was employed, where respondents could indicate their agreement levels on a spectrum from 1 (strongly disagree) to 5 (strongly agree). Based on the literature review introduced earlier and combined with the measurements in literature :FC[9] ,LC[10] ,DC[11],SMA[12], we constructed the theoretical model shown in Figure 1 and presented the specific content of each factor in Table 3

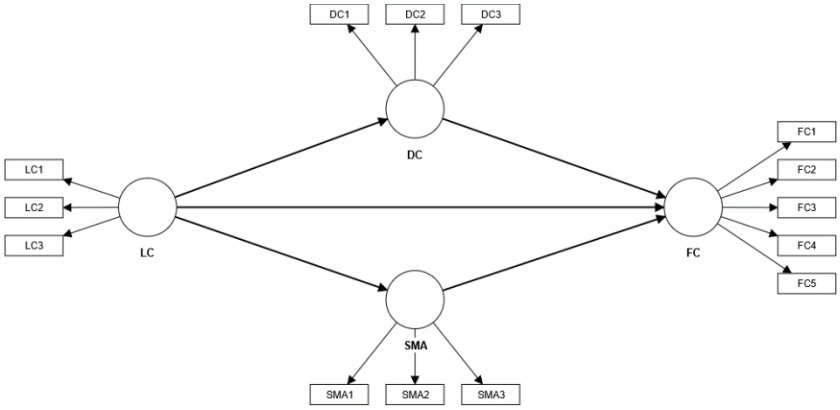

Fig. 1. Theoretical model

Subsequently, we have formulated the following hypothesis.

H1 LC -> FC: Leadership competency has a significant impact on the firm competitiveness

H2 LC -> DC: Leadership competency has a significant impact on digital capability.

H3 DC -> FC :Digital capability has a significant impact on company competitiveness

H4 LC -> SMA: Leadership competency have a significant impact on social media adoption

H5 SMA ->FC: Social media adoption has a significant impact on firm competitiveness

H6:Digital capability plays a mediating role between leadership competency and firm competitiveness

H7:Social media adoption plays a mediating role between leadership competency and firm competitiveness

4 Data analysis and results

4.1 Introduction

The survey was conducted over four months, from July to October 2023, covering 28 provinces and municipalities in China, including Beijing, Shanghai, Shandong, Chongqing, and Jiangsu, among others. The questionnaire collected by Chengdu Neusoft students in the form of an online questionnaire via Question Star to various student sources Data analysis adopted SPSS and SmartPLS 4 .

4.2 Descriptive Analysis

458 out of 600 were identified as valid and completed effectively, representing individuals from 28 Chinese provinces. Details are showed in table1.Compared to Table 2, the proportion of enterprises with less than 100 employees collected in the questionnaire is 68.40%, and the proportion of enterprises within 3 years is 42.60%, which is close to the proportion of enterprises with a registered capital of 2 million yuan in the real industry environment, which is 74.12%, and the proportion of enterprises within 3 years is 43.78%. The sample data is close to the real industry environment.

Table 1. Demographic information of respondents (N = 458)

Variable	Category	NumberofCases	Frequency(%)
Title	Front line administrative personnel	74	16.20
	Front line teachers	255	55.70
	Management layer	68	14.80
	Partners	17	3.70
	Investors	12	2.60
	Founders	17	3.70
	Others_____	15	3.30
Educational background	High school/technical school/vocational high school	5	1.09

	junior college	44	9.59
	Undegraduate	296	64.49
	Master's	86	18.74
	PhD	28	6.10
Age	18-25	170	37.04
	26-30	122	26.58
	31-40	89	19.39
	41-50	49	10.68
	51-60	28	6.10
	Above61	1	0.22
Institution size	Over 300 employees	41	9.00
	100-299 employees	104	22.70
	10 -99 employees	283	61.80
	less than 10 employees	30	6.60
Corporate Duration	Within 1	37	8.10
	1-3	158	34.50
	4-6	93	20.30
	7-9	106	23.10
	Above10	64	14.00

Table 2. Industry data

Public data	Category	Number of enterprises	Frequency(%)
Registered capital	Within 1 million	478053	55.16
	1-2 million	164322	18.96
	2-5 million	91947	10.61
	5-10 million	59822	6.90
	10-50 million	55609	6.42
	Over 50 million	16954	1.96
Corporate Duration	Within 1 year	173486	20.02
	1-3 years	205892	23.76
	3-5 years	163395	18.85
	5-10 years	241759	27.89
	Over 10 years	82175	9.48

(from https://www.qcc.com (As of November 27, 2023)

4.3 Model Analysis

The assessment of the model will be conducted by considering factors such as reliability, validity, measurement precision, and the synthesis of the model.

The data presented in Table 3 elucidates the internal consistency and reliability measures, as well as the validity, of the measurement tools associated with different constructs (DC, FC, LC, SMA). Overall, these indicators characterize the measurement tools as reliable and effective, rendering them suitable for related research and analysis.

Table 3. Construct Validity and Reliability

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
DC	0.920	0.92	0.949	0.862
FC	0.909	0.914	0.932	0.734
LC	0.889	0.897	0.931	0.819
SMA	0.867	0.869	0.919	0.790

Table 4 outlines the impact of individual measurement items on their respective constructs, where elevated values signify more substantial contributions. The weight signifies the relative significance of each measurement item in shaping the construct. The variance inflation factor (VIF) serves to identify multicollinearity, with higher values suggesting a potential presence of multicollinearity. In summary, these data affirm that the employed measurement model exhibits commendable quality and validity.

Table 4. Measurement model

Constructs	Item Code	Items	Loadings	Weights	VIF
FC	FC1	Our institution has a reserve of talents.	0.806	0.204	2.153
	FC2	Our institution is in good financial condition.	0.841	0.220	2.409
	FC3	Our institution is able to respond to market needs timely.	0.899	0.249	3.231
	FC4	Modern enterprise system is more sound in Our institution.	0.875	0.244	2.808
	FC5	There are closer relationships between Our institution and partners.	0.860	0.248	2.678
LC	LC1	Our institution has high level of conscientiousness.	0.857	0.333	2.040
	LC2	Our institution has high level of developing.	0.930	0.390	3.395
	LC3	Our institution has high level of empowering .	0.926	0.380	3.322
DC	DC1	Our institution has high level of acquiring important digital technologies.	0.930	0.357	3.475
	DC2	Our institution has high level of identifying new digital opportunities.	0.936	0.365	3.679
	DC3	Our institution has high level of responding to digital transformation.	0.918	0.355	3.029
SMA	SMA1	SM enhances our institution's image.	0.884	0.396	2.089
	SMA2	Our institution uses SM to cut down cost on marketing communications.	0.893	0.365	2.402
	SMA3	SM is compatible with our business Processes.	0.889	0.364	2.351

Table 5 indicates that the comparison between the Saturated Model and the Estimated Model shows relatively high values for SRMR, d_ULS, d_G, and Chi-square. This suggests that the estimated model differs from the fully saturated model on these indicators. The Chi-square value increases from 545.97 to 646.086, which may imply a decrease in model fit; however, Chi-square is sensitive to sample size and could be influenced by the size of the sample.

However, attention should also be paid to Table 6, where there is a strong positive correlation between DC and LC (0.956), a moderate positive correlation between FC and LC (0.563), a weak correlation between DC and SMA (0.044), and a moderate positive correlation between SMA and LC (0.543).In Table 6, the Average Variance Extracted (AVE) for each construct (DC, FC, LC, SMA) exceeds 0.5, with values of 0.928, 0.857, 0.905, and 0.889, respectively. This suggests a high level of explanatory power for the observed variables in relation to each construct.

Table5. Model fit

	Saturated model	Estimated model
SRMR	0.045	0.085
d_ULS	0.214	0.754
d_G	0.191	0.251
Chi-square	545.97	646.086
NFI	0.898	0.88

Table 6. f -square list

	DC	FC	LC	SMA
DC		0.044		
FC				
LC	0.956	0.563		0.543
SMA		0.027		

4.4 SEM Analysis and Hypotheses Testing

In the bootstrapping analysis, with the configuration of 10,000 subsamples, a two-tailed approach, and a significance level set at 5%, the outcomes are presented in Table 7 and Table 8. Examination of the p-values for each path in Tables 7 and 8 reveals statistical significance, as all values are below 0.05. Based on these findings, the following conclusions can be drawn:

H1DC -> FC :Digital capability positively influences firm competitiveness.

H2LC -> DC:Leadership competence significantly and positively influences digital capability.

H3LC -> FC:Leadership competence significantly and positively influences firm competitiveness.

H4LC -> SMA:Leadership competence significantly and positively influences social media adoption.

H5SMA -> FC:Social media adoption positively influences firm competitiveness.

H6LC -> DC -> FC :Digital capability mediates between leadership competency and firm competitiveness

H7LC -> SMA -> FC:Social media adoption mediates between leadership competency and firm competitiveness

Table7. Path coefficients

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
DC -> FC	0.189	0.188	0.063	3.008	0.003
LC -> DC	0.699	0.700	0.032	21.532	0.000
LC -> FC	0.595	0.600	0.068	8.730	0.000
LC -> SMA	0.593	0.595	0.046	13.010	0.000
SMA -> FC	0.130	0.128	0.050	2.629	0.009

Table8. Specific indirect effects

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
LC -> SMA -> FC	0.077	0.076	0.03	2.577	0.010
LC -> DC -> FC	0.132	0.131	0.044	2.999	0.003

5 Conclusions

Based on the empirical results of this study, we have confirmed the significant impact of leadership, digital capability, and social media adoption on the competitiveness of extracurricular training institutions. This not only reinforces the feasibility of assumptions in our research model but also provides crucial insights for the industry. The study indicates that these three factors play a pivotal role in the competitiveness of institutions, holding significant implications for elevating operational standards and fostering development.

However, there are some limitations to note in the study:

1.The surveyed companies' scale: Given that 68.4% of the surveyed organizations have fewer than 100 employees, and some organizations primarily rely on social media to represent their businesses, differing from larger enterprises that use various platforms such as websites, it is recommended that future research delves deeper into how company size influences pattern matching. In order to better understand the factors influencing competitiveness in organizations of different sizes, the next step of the study will conduct sensitivity analysis, dividing the collected 458 samples into small enterprises and medium-sized enterprises to investigate the impact of enterprise scale on the model.

2.Focus on Start-ups: With approximately 42.1% of surveyed companies having been established for less than three years, indicating a notable presence of start-ups in the industry, future research could spotlight this group. A thorough understanding of the unique challenges and opportunities in terms of leadership, digital capability, and social media adoption for start-ups could provide more practical recommendations for enhancing competitiveness.

3.Consideration of Employee Hierarchy: Since a significant 75.16% of respondents are frontline employees, future research might broaden its scope to encompass various employee hierarchies. The impact of leadership on frontline employees versus top-level managers may

differ, and therefore, including employee hierarchy in considerations could contribute to a more comprehensive understanding of how these factors influence competitiveness.

4.The model in the article involves fewer variables and only employs the method of questionnaire surveys using scales. However, during the process of questionnaire collection, respondents frequently mentioned issues such as customer relationship management, competitive advantages, advantages based on the scale of enterprises, the trend of declining birth rates, and the trend of reducing educational burdens, as well as the transition to a hybrid model.

In the next step of the research plan, the aforementioned factors such as customer relationship management and competitive advantages will be incorporated into the variable observation. The study will separate enterprises into large and small-scale categories to explore them separately. Additionally, a more in-depth background study will be conducted, combining the decline of demographic dividends and the reduction of educational burdens with the digital transformation in the extracurricular training industry. As the number of model variables increases, besides the questionnaire surveys, a qualitative approach involving individual interviews will be added to make the research methodology more robust.

Acknowledgment. The Sichuan Association for Non-Government Education project, Project No.MBXH23YB273

References

[1]KLEIN, M. (2020). LEADERSHIP CHARACTERISTICS IN THE ERA OF DIGITAL TRANSFORMATION. Business & Management Studies: An International Journal, 8(1). https://doi.org/10.15295/bmij.v8i1.1441

[2]Araujo, L. M. de, Priadana, S., Paramarta, V., & Sunarsi, D. (2021). Digital leadership in business organizations. International Journal of Educational Administration, Management, and Leadership. https://doi.org/10.51629/ijeamal.v2i1.18

[3]Araújo, K. K., & Behar, P. A. (2019). Digital Competences in Education: a Discussion of the Concept. In Educação em Revista (Vol. 35).

[4]Kreuzer, T., Lindenthal, A. K., Oberländer, A. M., & Röglinger, M. (2022). The Effects of Digital Technology on Opportunity Recognition. Business and Information Systems Engineering, 64(1). https://doi.org/10.1007/s12599-021-00733-9

[5]Shin, J., Mollah, M. A., & Choi, J. (2023). Sustainability and Organizational Performance in South Korea: The Effect of Digital Leadership on Digital Culture and Employees' Digital Capabilities. Sustainability (Switzerland), 15(3). https://doi.org/10.3390/su15032027

[6]Orozco, F. A., Serpell, A. F., Molenaar, K. R., & Forcael, E. (2014). Modeling competitiveness factors and indexes for construction companies: Findings of Chile | Modelando los Factores e ?ndices de Competitividad para Constructoras: Hallazgos en Chile. Journal of Construction Engineering and Management, 140(4). https://doi.org/10.1061/(ASCE)CO.1943-7862.0000462

[7]Rajković, B., Đurić, I., Zarić, V., & Glauben, T. (2021). Gaining trust in the digital age: The potential of social media for increasing the competitiveness of small and medium enterprises. Sustainability (Switzerland), 13(4). https://doi.org/10.3390/su13041884

[8]Kwayu, S., Lal, B., & Abubakre, M. (2018). Enhancing Organisational Competitiveness Via Social Media - a Strategy as Practice Perspective. Information Systems Frontiers, 20(3). https://doi.org/10.1007/s10796-017-9816-5

[9]Ni, G., Xu, H., Cui, Q., Qiao, Y., Zhang, Z., Li, H., & Hickey, P. J. (2021). Influence mechanism of organizational flexibility on enterprise competitiveness: The mediating role of organizational innovation. Sustainability (Switzerland), 13(1). https://doi.org/10.3390/su13010176

[10]Ahmed, R., Philbin, S. P., & Cheema, F. e. A. (2021). Systematic literature review of project manager's leadership competencies. In Engineering, Construction and Architectural Management (Vol. 28, Issue 1). https://doi.org/10.1108/ECAM-05-2019-0276

[11]Khin, S., & Ho, T. C. F. (2019). Digital technology, digital capability and organizational performance: A mediating role of digital innovation. International Journal of Innovation Science, 11(2). https://doi.org/10.1108/IJIS-08-2018-0083

[12]Qalati, S. A., Li, W., Ahmed, N., Mirani, M. A., & Khan, A. (2021). Examining the factors affecting sme performance: the mediating role of social media adoption. Sustainability (Switzerland), 13(1). https://doi.org/10.3390/su13010075