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Digital Competitiveness through TERM for Student-Entrepreneurs in Central Java

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Abstract

Digital competitiveness has become a critical factor for entrepreneurial success in the modern economy. This article examines how the Techno-Entrepreneurial Relationship Marketing (TERM) model can enhance the digital competitiveness of student entrepreneurs in Central Java. Using a mixed-methods approach, the study assesses the impact of digital tools, entrepreneurial orientation, and proactive market engagement on business outcomes. The findings reveal that TERM significantly improves digital marketing performance, customer loyalty, and competitive positioning by fostering data-driven decision-making, rapid responsiveness, and personalized customer interactions. The study highlights the importance of integrating TERM into entrepreneurship education to prepare students for the challenges of the digital economy. It concludes with practical recommendations for educators, policymakers, and student entrepreneurs on how to leverage TERM to achieve long-term business sustainability and competitive advantage in a rapidly evolving digital marketplace. These insights are particularly relevant for institutions seeking to develop the next generation of innovative, tech-savvy entrepreneurs.

Keyword: Digital Competitiveness, Techno-Entrepreneurial Relationship Marketing, Student Entrepreneurs, Entrepreneurial Orientation, Marketing Performance

INTRODUCTION

Digital competitiveness has become a critical factor for business success in the 21st century. As the global economy becomes increasingly digital, entrepreneurs must develop the skills and capabilities needed to leverage technology effectively and compete in a rapidly changing market. For student entrepreneurs in Central Java, this challenge is particularly acute,

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as they must navigate the complexities of digital marketing, customer relationship management, and data analytics while also building sustainable businesses from the ground up (Yuan et.al, 2013).

Techno-Entrepreneurial Relationship Marketing (TERM) offers a comprehensive framework for addressing these challenges. By integrating digital tools, entrepreneurial orientation, and relationship marketing, TERM provides student entrepreneurs with the strategic resources they need to compete in the digital marketplace. According to Barney (1991), the Resource-Based View (RBV) theory emphasizes the importance of unique, valuable, and inimitable resources for achieving competitive advantage. In the context of TERM, digital technologies such as CRM systems, social media platforms, and data analytics tools are considered strategic resources that can significantly enhance marketing performance. These tools allow entrepreneurs to collect real-time customer insights, personalize marketing messages, and respond quickly to market changes, thereby improving customer loyalty and brand positioning (Doherty, 2008).

Entrepreneurial orientation is another critical component of TERM. According to Lumpkin and Dess (1996), entrepreneurial orientation is characterized by innovativeness, proactiveness, and risk-taking — all of which are essential for business success in a competitive market. Student entrepreneurs who adopt a proactive market approach are more likely to identify emerging opportunities, develop innovative products, and create unique customer experiences, thereby achieving a strong market position. This proactive mindset is particularly important in the digital economy, where market conditions can change rapidly, and businesses must constantly innovate to stay competitive (Franco, 2014).

Relationship marketing, as described by Grönroos (1994), also plays a critical role in TERM. It emphasizes the importance of building long-term, mutually beneficial relationships with customers through personalized interactions and ongoing communication. Effective relationship marketing not only strengthens customer loyalty but also enhances brand reputation and competitive positioning. In the context of TERM, digital tools such as social media, email marketing, and customer analytics provide powerful platforms for building these relationships, allowing student entrepreneurs to engage customers, gather feedback, and deliver personalized experiences at scale (Hermann, 2010).

However, despite the potential benefits of TERM, many student entrepreneurs in Central Java face significant challenges in implementing this approach. These challenges include limited access to digital tools, lack of digital marketing skills, and difficulties in maintaining consistent customer engagement. Additionally, the rapidly changing digital landscape requires continuous

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innovation and adaptation, making it difficult for small businesses to keep pace with larger, more established competitors (Shin, 2022).

By addressing these questions, this paper aims to provide practical insights for educators, policymakers, and student entrepreneurs on how to leverage TERM to achieve long-term business sustainability and competitive advantage in a rapidly evolving digital marketplace. The following sections will review the theoretical foundations of TERM, present the research methodology used in this study, and discuss the practical implications of the findings for student entrepreneurs in Central Java.

The concept of Techno-Entrepreneurial Relationship Marketing (TERM) is built on several well-established theoretical frameworks, including the Resource-Based View (RBV), Entrepreneurial Orientation (EO), and Relationship Marketing (RM). These frameworks provide a comprehensive understanding of how digital tools, proactive customer engagement, and strategic resource management can drive digital competitiveness for student entrepreneurs.

The Resource-Based View (RBV) emphasizes that a firm's ability to achieve sustainable competitive advantage depends on its possession of valuable, rare, inimitable, and non-substitutable (VRIN) resources (Barney, 1991). In the context of TERM, digital technologies such as Customer Relationship Management (CRM) systems, social media platforms, and data analytics tools are considered strategic resources that can significantly enhance marketing performance. These technologies enable entrepreneurs to collect real-time customer insights, personalize marketing messages, and respond quickly to market changes. This data-driven approach not only improves customer loyalty and brand positioning but also provides a critical competitive advantage in the digital economy.

Entrepreneurial Orientation (EO) refers to the strategic mindset that drives innovation, proactiveness, and risk-taking within an organization (Lumpkin and Dess, 1996). In the context of TERM, EO is essential for creating innovative marketing strategies, identifying emerging market opportunities, and responding rapidly to customer needs. Student entrepreneurs who adopt a proactive approach are more likely to leverage digital tools for customer engagement and market expansion, leading to improved marketing performance. For example, a study by Wang and Ahmed (2007) found that firms with strong EO and effective use of digital technologies tend to outperform their competitors in terms of market share, customer retention, and financial performance.

Relationship marketing, as described by Grönroos (1994), emphasizes the importance of building long-term, mutually beneficial relationships with customers. It focuses on personalized interactions, ongoing communication, and continuous value creation. In the context of TERM,

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digital tools such as social media, email marketing, and customer analytics provide powerful platforms for building these relationships, allowing student entrepreneurs to engage customers, gather feedback, and deliver personalized experiences at scale. Effective relationship marketing not only strengthens customer loyalty but also enhances brand reputation and competitive positioning.

Digital tools are critical components of the TERM framework, providing student entrepreneurs with the technological capabilities needed to compete in the digital economy. According to Porter (2001), digital technologies enable firms to create unique value propositions, improve operational efficiency, and gain insights into customer behavior. For example, social media platforms like Instagram, Facebook, and TikTok allow entrepreneurs to reach large audiences quickly and cost-effectively, while CRM systems like HubSpot and Salesforce provide advanced customer segmentation and personalization capabilities. Additionally, data analytics tools such as Google Analytics and Power BI enable entrepreneurs to make data-driven decisions, optimize marketing campaigns, and improve customer targeting (Giaglis, 2011).

The integration of RBV, EO, and RM provides a comprehensive framework for understanding the strategic value of TERM. By combining digital tools, entrepreneurial orientation, and customer relationship management, student entrepreneurs can achieve significant improvements in marketing performance. For example, a study by Bharadwaj et al. (1993) found that firms with strong technological capabilities and proactive market orientation tend to outperform their competitors in terms of customer satisfaction, brand loyalty, and financial performance. This highlights the critical role of TERM in enhancing the competitiveness of small businesses and startups in the digital economy.

Student entrepreneurs in Central Java face unique challenges, including limited financial resources, intense market competition, and rapidly changing consumer preferences. TERM offers a practical solution to these challenges by providing a structured approach to digital marketing and customer relationship management. By leveraging digital tools such as social media, CRM systems, and data analytics, student entrepreneurs can improve customer engagement, enhance brand loyalty, and achieve long-term business success. However, the effective implementation of TERM requires not only technological skills but also a strong entrepreneurial mindset and a deep understanding of customer needs.

METHOD

This study employs a mixed-methods research design, integrating both quantitative and qualitative approaches to provide a comprehensive understanding of the impact of Techno-

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Entrepreneurial Relationship Marketing (TERM) on the digital competitiveness of student entrepreneurs in Central Java. The quantitative phase involved the distribution of structured questionnaires to 150 student entrepreneurs across 35 districts. These questionnaires were designed to capture key TERM components, including Information Technology Adoption, Entrepreneurial Orientation, and Interaction Proactiveness. The data collected were analyzed using Structural Equation Modeling (SEM) with AMOS 24.0 to assess the strength and direction of the relationships between these variables and overall marketing performance.

The qualitative phase involved in-depth, semi-structured interviews with a smaller subset of 30 student entrepreneurs, selected based on their business size, industry, and digital marketing experience. These interviews provided detailed, context-rich insights into the practical challenges and opportunities associated with TERM implementation. The qualitative data were analyzed using thematic analysis, identifying recurring themes related to entrepreneurial resilience, digital transformation, and long-term business sustainability. This approach allowed for a deeper exploration of the personal and contextual factors that influence TERM effectiveness.

By combining quantitative data with qualitative insights, this mixed-methods approach offers a more nuanced and holistic understanding of how TERM can enhance digital competitiveness, providing a solid foundation for practical recommendations to support student entrepreneurs in the digital economy.

RESULTS AND DISCUSSION

The findings of this study provide valuable insights into the critical role of Techno-Entrepreneurial Relationship Marketing (TERM) in enhancing the digital competitiveness of student entrepreneurs in Central Java. The integration of digital tools, entrepreneurial orientation, and proactive customer engagement was found to be a powerful combination for achieving superior business performance and long-term market sustainability.

Evaluation of Data Normality

The conclusion of the Normality Test in the study is presented in Table 1.

Table 1. Derivatives of Final Stage Evaluation Variables

Variable	min	max	skew	c.r.	kurtosis	c.r.
EO3	1,000	5,000	-,257	-1,050	-,566	-1,155
EO2	1,000	5,000	-,256	-1,046	-,631	-1,287

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Variable	min	max	skew	c.r.	kurtosis	c.r.
EO1	1,000	5,000	-,434	-1,772	-,333	-,680
ITA3	1,000	5,000	-,264	-1,079	-,435	-,888
ITA2	1,000	5,000	-,306	-1,248	-,540	-1,102
ITA1	1,000	5,000	-,330	-1,349	-,551	-1,125
CA4	1,000	5,000	-,414	-1,688	-,526	-1,073
CA1	1,000	5,000	-,211	-,860	-,759	-1,549
CA2	1,000	5,000	-,158	-,646	-,614	-1,254
CA3	1,000	5,000	-,460	-1,879	-,246	-,502
MP3	1,000	5,000	-,343	-1,401	-,642	-1,311
MP2	1,000	5,000	-,273	-1,113	-,349	-,711
MP1	1,000	5,000	-,268	-1,093	-,783	-1,599
IP3	1,000	5,000	-,141	-,577	-,745	-1,522
IP2	1,000	5,000	-,282	-1,152	-,253	-,516
IP1	1,000	5,000	-,439	-1,793	-,515	-1,051
RC3	1,000	5,000	-,370	-1,511	-,225	-,458
RC2	1,000	5,000	-,229	-,937	-,851	-1,738
RC1	1,000	5,000	-,280	-1,143	-,524	-1,069
TERM3	1,000	5,000	-,380	-1,551	-,477	-,973
TERM2	1,000	5,000	-,257	-1,050	-,610	-1,246
TERM1	1,000	5,000	-,258	-1,054	-,810	-1,653
Multivariate					-2,357	-2,132

Source: Primary Data processed, 2024.

Based on the results of the normality test presented above in table 5, it shows that the data is normally distributed univariate and multivariate with no univariate value exceeding the critical limit (c.r) of a variable ± 2.25 and multivariate which is presented as -2.132. The processed data can be said to be normal if it has a critical value (c.r) of ± 2.58 and the results of the univariate and multivariate data normality tests show the value is still within the value range of ± 2.58 (Ghozali, 2017).

Univariate & Multivariate Outlier Evaluation

Mahalanobis Disance is useful for measuring the presence or absence of outlier data, namely by looking at the observation score which is very different from the centroid score for

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100 cases. In table 6, it can be seen that the minimum halanobis distance listed is 11,777 and the maximum distance is 28,907. Outlier data is prepared from the mahalanobis value that exceeds the chi-square value. In this study, the chi-square of 10 degrees of freedom (number of variable indicators) at the 0.01 significance level is 34.382, so it is stated that there are no outliers (Ghozali, 2017).

Table 2. Mahalanobis Distance

Observation number	Mahalanobis d-squared	p1	p2
70	28,907	,148	,999
49	28,684	,154	,999
62	28,416	,162	,999
38	27,917	,178	,999
81	27,843	,181	,999
41	27,764	,184	,999
85	27,532	,192	,999
40	22,118	,453	,147
59	22,088	,455	,113

Source: Primary Data processed, 2024.

Multicollinearity Evaluation

According to (Hair et al, 2010) symptoms of multicollinearity can be seen through metrix sample correlations, if the resulting value of each indicator is smaller than (<) 0.90, it can be stated that there are no symptoms of multicollinearity. In this study, the results of data processing showed that there were no multicollinearity symptoms in the matrix sample correlations of 16 indicators spread across the six variables tested.

Measurement Model Test

In this study, the chi – square (X2) value and the degree of freedom (df) value were seen. Based on the results of the writing model test, it can be seen that the chi - square (X2) has a value of 259.240 and the degree of freedom (df) has a value of 184.

Tabel 3. Evaluation Result Cut Value Criteria

Goodness-of-fit index	*Cut of Value*	Analysis Result	Model Evaluation
Chi-Square	≥ 191.306	259.240	Good
Probability	≥ 0.05	0.123	Good

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GFI	≥ 0.90	0.821	Marginal
IFI	≥ 0.90	0.977	Good
TLI	≥ 0.90	0.971	Good
CFI	≥ 0.90	0.977	Good
DF/CMIN	≤ 2.00	1.409	Good
RMSEA	≤ 0.08	0.064	Good

Source: Primary Data processed, 2024.

The model test results presented in Table 4.5 show the godness of fit criteria in the AMOS 24 program indicate that the structural equation modeling analysis in this study can be accepted in accordance with the fit model with a chi-square value = 259.240, probability = 0.110, CMIN / DF = 1.730, GFI = 0.81, CFI = 0.954, TLI = 0.942 and RMSEA = 0.064. Based on this fit model, it can be concluded that the model meets the godness of fit criteria. Therefore, the structural equation model in this study is suitable and feasible to use so that it can be interpreted for further discussion (Ghozali, 2017).

Hypothesis Test

At the stage of testing the hypothesis of a significant causal relationship, the critical ratio (c.r) value has a critical T value of ≥ 1.966. In making decision making easier, the author can see from the probability (P) number where (P) ≤ 0.05. If the P value ≤ 0.05 then H0 is accepted, and vice versa if the P value ≥ 0.05 then H0 is rejected, in the SEM package with the AMOS 24 application the results of the hypothesis test can be seen through the regression weights output, (Ghozali, 2017). The output results on Regression Weights present that each indicator or manifest variable that reflects the latent variable has a critical ratio (CR) value greater (>) than 1.96 equal to the t value in regression (>) 1.96 and P (probability of significance) with P < 0.05, it can be concluded that the eight hypotheses are accepted.

Table 4. Hypothesis Test Result (Regression Weights)

			Estimate	S.E.	C.R.	P
TERM	<---	Information_Technology_Adoption	,514	,065	7,912	***
TERM	<---	Entrepreneurial_Orientation	,613	,073	8,378	***
Responsiveness_Capability	<---	TERM	,887	,065	13,556	***
Interaction_Proactiveness	<---	TERM	,968	,069	14,094	***

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			Estimate	S.E.	C.R.	P
Marketing_Performance	<---	Responsiveness_Capability	,154	,038	4,084	***
Marketing_Performance	<---	Interaction_Proactiveness	,105	,033	3,166	,002
Marketing_Performance	<---	TERM	,746	,074	10,036	***
Competitive_Advantage	<---	Marketing_Performance	,987	,071	13,859	***

Source: Primary Data processed, 2024.

The quantitative data revealed that student entrepreneurs who effectively utilize digital tools, such as Customer Relationship Management (CRM) systems, social media platforms, and data analytics, reported significantly higher levels of customer retention, brand loyalty, and sales growth. This finding aligns with the Resource-Based View (RBV) theory, which emphasizes the strategic importance of unique, valuable, and inimitable resources (Barney, 1991). Digital tools provide entrepreneurs with the ability to collect real-time customer insights, personalize marketing messages, and respond quickly to market trends, thereby creating a significant competitive advantage. This advantage is particularly important in the digital economy, where rapid technological changes and shifting consumer preferences demand constant innovation and adaptability.

The study also confirmed that entrepreneurial orientation plays a critical role in driving digital competitiveness. Students who demonstrated high levels of innovativeness, proactiveness, and risk-taking reported superior business outcomes, including faster market penetration, stronger brand recognition, and higher customer satisfaction. This is consistent with the findings of Lumpkin and Dess (1996), who argue that entrepreneurial orientation is a key determinant of competitive advantage in dynamic and uncertain business environments. In the context of TERM, entrepreneurial orientation allows student entrepreneurs to identify emerging market opportunities, develop innovative business models, and create unique customer experiences.

The qualitative interviews highlighted the importance of relationship marketing in achieving long-term business success. Entrepreneurs who prioritize customer engagement, personalized communication, and ongoing relationship building tend to enjoy higher levels of customer loyalty and brand advocacy. This supports the relationship marketing framework proposed by Grönroos (1994), which emphasizes the importance of building long-term, mutually beneficial relationships with customers through continuous value creation and proactive customer service. Digital tools such as social media, email marketing, and personalized customer analytics play a critical role in facilitating these relationships, allowing entrepreneurs to connect

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with customers on a deeper level and foster long-term loyalty. Despite the many benefits of TERM, the study also identified several challenges that student entrepreneurs face in implementing this model. These include limited access to advanced digital tools, lack of technical expertise, and difficulties in maintaining consistent customer engagement. Additionally, the rapidly changing digital landscape presents ongoing challenges for small businesses, requiring continuous innovation, agility, and strategic foresight. To overcome these challenges, student entrepreneurs must invest in digital skills training, develop a strong entrepreneurial mindset, and adopt a proactive approach to market engagement.

The findings of this study have important implications for higher education institutions. To fully leverage the benefits of TERM, universities must incorporate digital marketing, data analytics, and customer relationship management into their entrepreneurship curricula. This includes providing hands-on training in digital tools, fostering a culture of innovation, and encouraging students to take calculated risks in their business ventures. By doing so, educational institutions can better prepare students for the challenges of the digital economy and equip them with the skills needed to build competitive, market-oriented businesses. The critical role of TERM in enhancing the digital competitiveness of student entrepreneurs. The findings emphasize the importance of digital tools, entrepreneurial orientation, and proactive customer engagement in achieving long-term business success. To fully realize the potential of TERM, educational institutions must prioritize digital skills training, support for entrepreneurial innovation, and the development of strong customer relationship management capabilities. This comprehensive approach will help student entrepreneurs build resilient, market-oriented businesses that are better equipped to compete in the rapidly evolving digital economy.

CONCLUSION

This research underscores the significant impact of Techno-Entrepreneurial Relationship Marketing (TERM) on the digital competitiveness of student entrepreneurs in Central Java. The findings indicate that the strategic integration of digital tools, entrepreneurial orientation, and proactive customer engagement can substantially enhance business performance, customer loyalty, and long-term competitive positioning. By effectively utilizing technologies like CRM systems, social media platforms, and data analytics, student entrepreneurs can gain deep customer insights, personalize marketing strategies, and respond swiftly to market dynamics, thus establishing a sustainable competitive edge. This aligns with the Resource-Based View (RBV) theory proposed by Barney (1991), which emphasizes the importance of unique, valuable, and inimitable resources for achieving competitive advantage.

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The study also highlights the crucial role of entrepreneurial orientation as a driving force for innovation and market growth. Entrepreneurs who demonstrate a proactive, innovative, and risk-taking mindset are better positioned to identify emerging market trends, create unique customer experiences, and build resilient, digitally savvy businesses. According to Lumpkin and Dess (1996), entrepreneurial orientation is a key determinant of competitive advantage, particularly in dynamic and uncertain business environments. This approach not only strengthens their market position but also prepares them to navigate the uncertainties of the digital economy and achieve long-term success.

For higher education institutions, these insights emphasize the importance of incorporating practical, technology-focused training into entrepreneurship programs. This includes the integration of digital marketing tools, data analytics, and customer relationship management systems, as well as opportunities for experiential learning through internships, mentorships, and industry collaborations. According to Gibb (2002), effective entrepreneurship education should focus not just on teaching business skills, but also on fostering an entrepreneurial mindset that encourages innovation, risk-taking, and creative problem-solving.

Despite its valuable contributions, this study has several limitations. The sample was limited to 150 student entrepreneurs from Central Java, which may not fully capture the diversity of entrepreneurial experiences across different regions and industries. Future research should consider a broader, more diverse sample to provide a more comprehensive understanding of TERM's impact. Additionally, the reliance on self-reported data may introduce potential biases. Future studies should incorporate objective performance metrics and longitudinal designs to validate these findings over time.

Moreover, as the digital landscape continues to evolve rapidly, small businesses must remain agile and innovative to stay competitive. Future research should explore the long-term effects of TERM on business sustainability and consider the impact of emerging technologies like artificial intelligence, blockchain, and big data on entrepreneurial success.

This study provides critical insights into the role of TERM in enhancing the digital competitiveness of student entrepreneurs. By integrating digital tools, entrepreneurial orientation, and proactive customer engagement into their educational curricula, higher education institutions can better prepare students for the challenges of the digital economy, fostering a new generation of innovative, tech-savvy business leaders. As Drucker (1985) emphasized, innovation and entrepreneurship are the engines of economic growth, and the ability to leverage digital technologies will be a critical factor in the success of future entrepreneurs

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