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MEASUREMENT OF ABSORPTIVE CAPACITY IMPLICATION IN SMALL AND MEDIUM INDUSTRIES
(Case In Ngingas Small Metal Industry Cluster)

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Abstract

The post-COVID-19 era presents an opportunity for businesses to recover and achieve peak performance after a significant decline due to the economic recession. The manufacturing industry, heavily impacted during the pandemic, is now under pressure to return to normal. Small and medium industries, particularly those in industrial clusters, have a unique ability to recover quickly. In a knowledge-based economy, mastering necessary knowledge is key to improving business performance. This concept, known as absorptive capacity, explains how organizations acquire and apply knowledge to gain a competitive edge. This study investigates absorptive capacity in small and medium-sized industrial clusters, focusing on acquisition, assimilation, transformation, and exploitation. The research, involving 127 respondents from the metal industry cluster in Ngingas Village, Waru District, Sidoarjo, Indonesia, found that the acquisition factor is dominant in acquiring external knowledge, while the assimilation factor is the least dominant in the knowledge mastery process.

Keywords : **small & medium industries, knowledge, absorptive capacity, factor analysis**

A. INTRODUCTION

The Covid-19 pandemic has created an extraordinary phenomenon and has had a major impact on all activities in the world. It can almost be said that all sectors of life are affected due to the global effects of the almost cessation of various sectors including economic, political, social and socio-cultural (Fernandes, 2020; Abdi, 2020; Maital & Barzani, 2020). The global economy experienced a significant decline, which had an impact on the economies of all countries which showed growth at rates approaching zero or even negative. The global economy experienced a very sharp recession and experienced an economic decline of -2.8% (Liu et al., 2020). Meanwhile, in developing countries the Covid-19 pandemic has caused economic devaluation down to the MSME scale (Abuselidze & Slobodianyk, 2019).

In 2023, economic trends show indications that business sectors will begin to recover because several activities and human mobility will begin to relax. However, after looking further, it turns out that the hope that the business world will soon recover is not that easy. Many business sectors tend to be slow in recovering their economic activities. This also happens in the small and medium industrial sector (Sholihah, 2021).

The manufacturing industry is one type of business model that has come under enormous pressure during Covid-19. On the other hand, the manufacturing industrial sector is required to recover quickly and perform well. This is because the manufacturing industry is the main driver of a country's economic growth (Rocha, 2018; Wolok et al., 2023). Small and medium industries as a class of manufacturing industry are unique in their ability to recover quickly (Handiwibowo et al., 2021).

In this era of knowledge-based economy, a business organization is required to be able to master the knowledge needed by the organization in order to be able to have an

impact on the level of competitiveness of the organization. Mastery of knowledge in an organization can be generated from internal processes (including through the R&D process) or can be obtained from outside the organization. This competitive ability is strategic enough so that the business organization is able to exist or at least survive in its business environment. In this research, the focus of discussion will be directed at the orientation of business organizations to be able to master knowledge sought from external organizations (Handiwibowo et al., 2024).

Theoretically, the ability to acquire and implement knowledge obtained from external organizations is called absorptive capacity (AC) (Ferreira & Ferreira, 2017). Absorptive capacity refers to a company's ability to acquire, assimilate, transform, and exploit new knowledge (Wales et al., 2013). Absorptive capacity is an ability that can be developed by companies to be able to have knowledge capability. The better the company's ability to acquire, absorb and adapt external knowledge, the better the company's expected business performance will be. So absorptive capacity is one of the factors to improve the business performance of a business organization (Handiwibowo et al., 2021).

Research related to absorptive capacity in business organizations is dominated by large-scale business organizations. There is still quite a bit of research that tries to explore the concept of absorptive capacity in business organizations in the form of small medium enterprises (Mustafa Kamal & Flanagan, 2012). So, to contribute knowledge to the scientific field of strategic management, this research will use an analysis unit in business organizations in the form of small medium enterprises.

This research makes manufacturing SMEs in Ngingas Village, Kec. Waru, Sidoarjo Regency as research object. The collection of manufacturing SMEs in Ngingas Village is better known as IKM Logam Ngingas. The IKM Logam Ngingas consists of around 500 Logam craftsmen from both small and large scales. The monthly turnover of all members of IKM Logam Ngingas is around Rp. 50 billion. This IKM interesting to research because apart from its industrial model being quite small, the area of IKM Logam Ngingas is not too large. The area coverage of IKM Logam Ngingas is around 200 hectares. This model of a collection of small industries has been adopted by many small and medium industries to form industrial clusters with various product themes.

This research will provide an overview of how the concept of absorptive capacity is translated by small & medium scale business organizations. The results of this research can be used as a lesson, especially for IKM Logam Ngingas, to increase their competitiveness in the future. The results of this research can also be used as an illustration for industrial models in the form of clusters.

B. LITERATURE REVIEW

New knowledge is important for Business organizations to increase their competitive capacity. New knowledge is often obtained by organizations from external to the organization (Handiwibowo et al., 2024). These new things become knowledge that can be managed by the organization for its business interests. Organizations need knowledge that comes from new things to boost their competitive advantage (Handiwibowo et al., 2020).

Absorptive capacity is defined as the ability of an organization to identify new external information, absorb this information and apply it and to create new business. Absorptive capacity theory states that an organization with the ability to absorb and apply new knowledge can not only increase its innovation capabilities and agility, but

ultimately is able to improve company performance. With its absorptive capacity, organizations can use knowledge obtained from outside efficiently (Matusik & Heeley, 2005) and are able to convert this knowledge into economic value (Murovec & Prodan, 2009).

Zahra and George (2002) reconstructed the concept of absorptive capacity and defined it as "a set of acquisition, assimilating, transforming, and exploiting external knowledge with internal resources and acts as a process framework for innovation (Patterson & Ambrosini, 2015)", it is a process concept based and multi-dimensional. Therefore, absorptive capacity can be seen as one of the dynamic capabilities of a company.

Studies agree that absorptive capacity is a multi-dimensional construct. Zahra and George (2002) reconceptualized the concept and suggested that acquisition, assimilation, transformation and exploitation are dimensions of absorptive capacity. In addition, they argue that absorptive capacity consists of two subsets: potential absorptive capacity and realized absorptive capacity. The first two dimensions represent potential absorptive capacity and the last two dimensions represent realized absorptive capacity (Zahra & George, 2002). Todorova and Durisin (2007) suggest that absorptive capacity has four dimensions: recognition, acquisition, assimilation or transformation and exploitation.

Acquisition is the ability to obtain critical external knowledge (Zahra & George, 2002). Assimilation is the ability to absorb and internalize acquired knowledge (Camisón & Forés, 2010). Transformation is the ability to transform assimilated knowledge into a company's own routines (Jiménez-Barrionuevo et al., 2011). Exploitation is a capability that allows a company to improve current competencies and to create new things using transformed knowledge (Zahra & George, 2002). The four dimensions initiated by Zahra and George (2002) will be implemented in the following research.

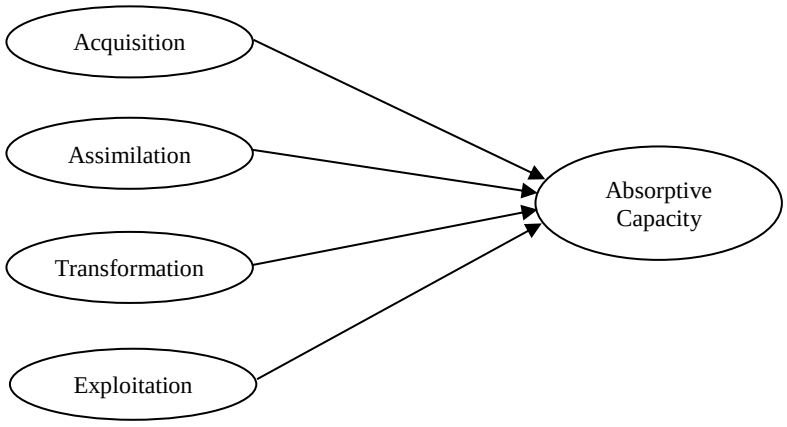

Figure 1. Conceptual Framework

C. RESEARCH METHOD

This research uses a small and medium industry analysis unit or IKM Logam Ngingas located in Ngingas Village, Waru District, Sidoarjo. With a population that is not too large, to collect data a saturated sampling technique is used, which means that all members of the population will be taken as samples. Respondents are business

owners, directors or general managers who oversee a business organization at IKM Logam Ngingas and have held that position for at least 2 years. The type of position and length of service assumes that the respondent knows in detail all the activities within the business organization. The age of respondents is limited to between 20 – 65 years, which is the productive age for the workforce. The average turnover of the samples taken is limited to more than Rp. 20 million per month. With this turnover assumption, it is hoped that the sample taken will be a business organization that has been continuously conducting business.

The measurement scale used is a scale of 5 where a value of 1 indicates the level of disagreement and a scale of 5 indicates the level of agreement of the respondent perceptively regarding the statements in the questionnaire. Data was processed using software.

Field data collection was carried out through offline interviews by visiting respondents directly and asking each statement verbally. This method was chosen to avoid misperceptions of the statements given. This method is also quite effective for obtaining data because there is considerable resistance from the object to be analyzed, especially the suspicion that this research will have a negative effect on the object of analysis in the future.

From the results of data collection, 212 data were collected. Of the 212 data collected, 203 data were suitable for further analysis. Instrument testing in this research includes validity and reliability tests on the data collected. This validity and reliability test is needed to meet the standards of good research methods for the measurement instruments used before the data is processed with software.

D. RESULTS AND DISCUSSION

Table 1: Path Coefficients

	Original Sampel (O)	Sampel Mean (M)	Standard Deviation (STDEV)	T Statistic (O/STDEV)	P Values
Acquisition -> Absorptive Capacity	0,187	0,187	0,006	32,036	0,000
Assimilation -> Absorptive Capacity	0,082	0,082	0,002	39,138	0,000
Transformation -> Absorptive Capacity	0,092	0,092	0,006	16,735	0,000
Exploitation -> Absorptive Capacity	0,102	0,102	0,004	22,699	0,000

As explained in the previous chapter, this research aims to measure each indicator of the Absorptive Capacity variable by means of instrument testing. Evaluation of the measurement model is carried out by comparing the significance of the outer loading value for each indicator. The measured outer loading value (T-statistic) must be greater than 1.96 and go through a bootstrapping procedure. By getting an outer loading value greater than 1.96 for each indicator in the Absorptive Capacity variable, construct validity and reliability tests are no longer needed (Ghozali, I & Kusumadewi, 2016). Instrument tests on the Absorptive Capacity variable can be monitored from the results of path coefficient analysis on each indicator, namely the acquisition, assimilation, transformation and exploitation indicators.

As the calculation result from software in Table.1, the acquisition indicator has an outer weight value of 0.187 with T-Statistic (CR) of 32.036 is significant. The acquisition indicator indicates the ability of getting new external knowledge that comes from outside

the organization (Zahra & George, 2002). Acquisition indicators are associated with several activities, including the desire to know what products customers expect, the quality level of customer perception, the urge to gain new knowledge and the speed of absorbing new knowledge.

In the assimilation indicator, the outer weight value calculation result is 0.082 and T-Statistic (CR) of 39.138 which shows significance. The assimilation indicator indicates the ability to turn newly acquired knowledge into internal capabilities of the organization (Camisón & Forés, 2010). The assimilation indicator is associated with analytical activities to determine customer expectations, learning from historical past and opening discussion space for employees to reveal knowledge.

For the transformation indicator, the analysis results show an outer weight value of 0.092 with T-Statistic (CR) of 16.735, the lowest of all and still significant. The transformation indicator provides an overview of the ability to transform new knowledge into routine daily activities (Jiménez-Barrionuevo et al., 2011). Transformation indicators include activities to document new knowledge for future reference, evaluate business processes and identify new knowledge needs for process improvement.

The last one is the exploitation indicator where the analysis results show an outer weight value of 0.102 with T-Statistic (CR) of 22.699 and is still significant. This exploitation indicator is able to provide an overview of the company's capabilities to improve its competencies and produce new things from the new knowledge it has (Zahra & George, 2002). Exploitation indicators include activities of utilizing new knowledge to improve work processes, evaluating existing work processes and combining new knowledge with business opportunities.

This study aims to measure how small and medium-sized industries (SMEs), particularly in the manufacturing sector, acquire new knowledge and utilize it to improve their competitiveness. By focusing on the metal industry cluster in Ngingas Village, Waru District, Sidoarjo, this study applies the concept of *absorptive capacity*, introduced by Zahra and George (2002), to manage external knowledge. According to their theory, absorptive capacity refers to the ability of an organization to identify, assimilate, transform, and exploit new knowledge in order to enhance internal competencies and improve organizational performance.

This study emphasizes the importance of absorptive capacity as one of the key factors in improving business performance, as suggested by Zahra and George (2002). The findings of this study show that the acquisition factor is the dominant dimension in the absorptive capacity process, which aligns with their theory on the importance of acquiring new knowledge from external sources. This result also concurs with Matusik & Heeley (2005), who argued that acquiring external knowledge is essential in boosting an organization's innovation and agility.

However, despite the dominance of acquisition, this study also revealed significant challenges in the assimilation dimension, which involves internalizing external knowledge. This finding echoes Camisón & Forés (2010), who highlighted that assimilation is a crucial factor in converting acquired knowledge into internal capabilities that can be applied for innovation and developing competencies. In this case, the difficulty observed in IKM Logam Ngingas in assimilating knowledge indicates that, although new knowledge is acquired, there are barriers in internalizing it effectively into daily business operations.

The transformation factor also shows significant results, although lower compared to acquisition and assimilation. The ability to transform knowledge into routine business

activities, as stated by Jiménez-Barrionuevo et al. (2011), proves to be a challenge for IKM Logam Ngingas. This indicates the need for more structured processes to document and integrate new knowledge into daily operations. As a result, it underscores the necessity of enhancing internal systems to effectively convert external knowledge into actionable routines that contribute to continuous improvement.

The exploitation factor, on the other hand, shows a higher level of awareness and utilization of acquired knowledge to improve internal competencies and generate new ideas. This finding is consistent with Zahra and George (2002), who argued that exploitation enables companies to improve work processes and create new products or services by leveraging transformed knowledge. The results from this study suggest that IKM Logam Ngingas is proficient in utilizing knowledge to improve work processes and combine new insights with business opportunities, thus enhancing their competitive advantage.

This study also aligns with prior research conducted by Mustafa Kamal & Flanagan (2012), which explored the application of absorptive capacity in small and medium-sized enterprises (SMEs). Their research found that SMEs face challenges in assimilating and transforming external knowledge into practical business applications. This observation is similar to the results found in this study, where the acquisition factor was dominant, but the challenges in assimilation and transformation remained significant. This suggests that, despite successfully acquiring external knowledge, SMEs like IKM Logam Ngingas struggle with internalizing and applying it effectively to enhance their internal competencies.

Moreover, the study by Ferreira & Ferreira (2017) emphasizes that absorptive capacity, which includes acquisition, assimilation, transformation, and exploitation, is a critical factor for improving business performance. The results from this study reflect this, as both the acquisition and exploitation dimensions showed significant results. However, the lower performance in the transformation dimension highlights the need for a more robust internalization process to ensure that acquired knowledge can be effectively transformed into operational improvements and innovations.

The findings from this study suggest that, to strengthen the competitiveness of IKM Logam Ngingas, there needs to be a more structured effort in the assimilation and transformation processes. According to the absorptive capacity theory, it is essential for SMEs not only to acquire external knowledge but also to ensure that this knowledge can be internalized, transformed, and applied within their internal systems. Therefore, SMEs need to develop systems that support knowledge internalization through employee training, knowledge-sharing practices, and continuous learning processes.

Furthermore, the results of this study provide valuable insights for other SMEs within industrial clusters. By optimizing their absorptive capacity, SMEs can enhance their competitive edge and adapt more quickly to changing market conditions. This aligns with the view proposed by Wales et al. (2013), who argue that absorptive capacity is a dynamic capability that leads to long-term performance improvements and innovation.

Overall, while this study identifies the dominance of the acquisition factor in the absorptive capacity process, the biggest challenges lie in transforming and assimilating external knowledge into sustainable internal competencies. Therefore, it is crucial for SMEs to focus on enhancing their internal systems to support the effective conversion of acquired knowledge into practices that foster continuous improvement and competitive advantage.

E. CONCLUSION

This study revealed that in the small metal industry cluster in Ngingas, Waru District, Sidoarjo, the acquisition factor is the dominant element in the absorptive capacity process, indicating that business stakeholders have a high level of awareness in acquiring external knowledge to improve their competencies. However, the assimilation factor was the least dominant, indicating challenges in internalizing new knowledge into the organization's internal competencies. Although the transformation and exploitation factors showed significant results, the biggest challenge lies in the ability to transform acquired knowledge into effective operational routines. The findings of this study provide valuable insights for small and medium enterprises, particularly in improving internal processes to assimilate, transform, and exploit external knowledge to strengthen competitiveness and business performance in the future. This research also contributes significantly to understanding absorptive capacity in small and medium-sized enterprises.

Based on the findings of this study, it is suggested that small and medium enterprises (SMEs) in the metal industry cluster in Ngingas, Waru District, Sidoarjo, focus on improving their internal processes to better assimilate and transform external knowledge into internal competencies. This can be achieved through systematic training, fostering a culture of knowledge sharing, and developing clear procedures for incorporating new knowledge into daily operations. Additionally, enhancing internal collaboration and creating platforms for knowledge exchange among workers can further improve the assimilation process.

For future research, it is recommended to explore the factors that hinder the assimilation and transformation of external knowledge into internal practices. Studies could investigate how different types of external knowledge (e.g., technological, market-related) influence the absorptive capacity of SMEs. Furthermore, future research could compare the absorptive capacity of SMEs in different industries or regions to identify best practices and scalable models for improving competitiveness through effective knowledge management.

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