

Measuring Batik Industry Resilience through Economic Transformation

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Abstract

This research aims to measure the resilience of the Indonesian batik industry through an analysis of economic transformation in response to changing global dynamics. By focusing on key indicators, this research gains in-depth insight into how economic changes affect the competitiveness, sustainability and growth of the batik industry. Through a holistic methodology, this research explores the challenges and opportunities facing the batik sector, providing a basis for formulating relevant and adaptive strategies in maintaining the sustainability of the batik industry as an integral part of Indonesia's cultural heritage and economy in the era of global economic transformation. The research methods used were qualitative and quantitative approaches. A survey was conducted on Ponorogo Batik Industry. Students resilience was measured by the NMRQ Questionnaire (Nicholson McBride Resilience Questionnaire) and the factors affecting resistance were measured by the SAJA Questionnaire. From the qualitative approach, the study found that the level of social resilience of batik industry was quite high due to the application of the Industry Resilience Strategies. From the quantitative approach, most students could build resilience and change their perceptions from difficult conditions to pleasant learning conditions due to social and economic factors. The factor that most influences the level of social resilience of batik industry was the personality factor.

Keywords: Social Resilience; Batik Industry; NMRQ method, Economic Transformation

1. INTRODUCTION

The batik industry has long been an integral part of Indonesia's cultural heritage, reflecting the rich arts and traditions that have been passed down from generation to generation. However, along with global economic dynamics and changes in consumer patterns, the batik industry is faced with increasingly complex challenges. To understand the resilience of the batik industry in facing economic changes, it is necessary to carry out comprehensive measurements of the economic transformation that has occurred in the context of this industry.

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Measuring the resilience of the batik industry through economic transformation is a crucial aspect in understanding how economic changes can affect the competitiveness, sustainability and growth of the batik sector (Muhibuddin et al., 2021). By digging deeper into the dynamics of economic transformation in the context of the batik industry, we can identify opportunities and challenges that need to be overcome to ensure the continuity of this industry as an important pillar in the Indonesian economy.

An in-depth understanding of the economic transformation in the batik industry will also help formulate appropriate policies to increase the resilience of this sector amidst changing times. Therefore, this research aims to measure the resilience of the batik industry through the lens of economic transformation, explore key indicators, and develop strategic recommendations to strengthen the position of the Indonesian batik industry in the ever-changing global economic map.

Resilience is one's ability to remain steadfast even in difficult circumstances (Reivich & Shatté, 2002). The level of resilience of children when affected by a disaster, depends on their adjustment to the system, both the system of children's relationships with their nanny, family, and friends. As well as the resources that they can get from their family, environment and school (Masten & Barnes, 2018). Resilience in learning during the pandemic is expected to be formed by the majority of batik industry. This is because resilience is very influential in maintaining the enthusiasm and motivation of employee learning so that they are not left behind in studying learning materials and can maintain the quality of batik industry in Indonesia.

2. LITERATURE CONTEXT

Research on the resilience of the batik industry in the context of economic transformation received conceptual support through an in-depth literature review (Jeans et al., 2017). Previous works underscore the importance of measuring industry resilience in the face of global economic change, while also highlighting the unique and strategic role of the batik industry as a transmitter of cultural heritage. The literature also provides insight into critical indicators that can be used to evaluate the resilience of the industry, as well as detailing the impact of economic transformation on the manufacturing, arts and creative economy sectors, all of which are relevant in a deeper understanding of the resilience of the batik industry in the current era of economic transformation (Muhibuddin et al., 2021).

To measure the level of batik industry resilience, three indicators can be used as reference, namely absorptive related to the stability of the batik industry situation, adaptive related to the flexibility of the batik industry situation and transformation capacity related to the batik industry situation which requires a structural change (Erikson, 1993; Piaget, 1971).

The importance of measuring industrial resilience in the face of economic change has become the focus of research in various sectors, including creative industries such as batik. As global dynamics continue to change, there is a consensus in the literature that measuring industrial resilience not only includes economic aspects, but also social, cultural and environmental aspects. In the context of the batik industry, literary works highlight the important role of this sector in strengthening a country's cultural identity, while simultaneously adapting to developing economic demands. The development of a conceptual framework that combines economic indicators with cultural and creative elements provides a strong basis for understanding and measuring the resilience of the batik industry through the lens of economic transformation (Al Hakim, 2021).

As the literature on industrial resilience develops, there is a growing body of research that emphasizes the central role of economic transformation in shaping industrial sustainability and competitiveness (Muhibuddin et al., 2021). Through literature analysis,

we can understand that changes in consumer patterns, technology, and economic policies can trigger significant transformations in the manufacturing industry, including the batik sector. Therefore, the literature provides an important theoretical foundation for exploring how economic transformation is affecting the batik industry specifically, while detailing indicators that can be measured to illustrate the sector's resilience. By understanding the conceptual framework and related literature findings, this research can make a significant contribution to developing relevant and sustainable strategies for the growth of the batik industry in the era of global economic transformation.

Researchers found 313 publications linking social resilience and economic transformation. The search was limited to the time period from 2013 to 2023 when this research was compiled. Other restrictions are in the fields of Social Sciences, Business, Management and Accounting, and Economics, Econometrics and Finance. The distribution of publication data obtained is as follows:

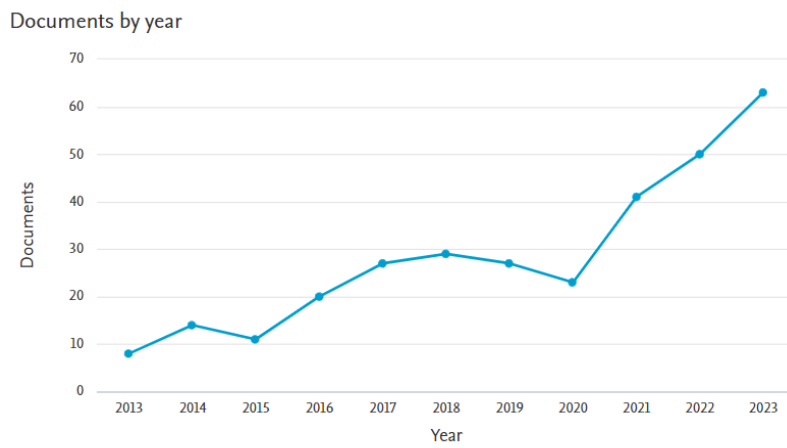


Figure 1. Development of publications on the topic of social resilience and economic transformation in the last 10 years (sources: Scopus.com 2023)

Development of publications related to social resilience and economic transformation. The graph shows that in general research and publications related to social resilience and economic transformation have increased, except in 2015 and 2020. This decrease could be due to the impact of the crisis that occurred at both times. Meanwhile, the number of publications after the Covid pandemic showed a very significant increase. Meanwhile, if differentiated according to country differences, it can be seen in the following picture:

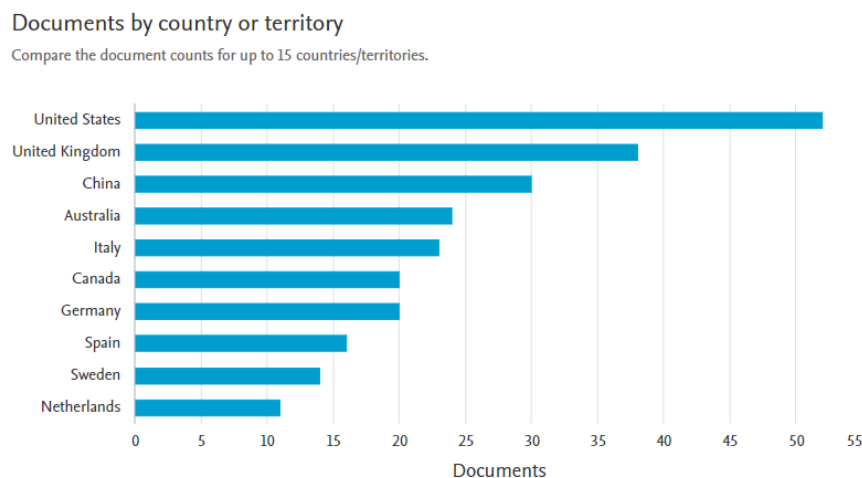


Figure 2. Distribution of publications on the topic of social resilience and economic transformation in various countries (sources: Scopus.com 2023)

The picture above shows that the highest research objects on social resilience and economic transformation are in America, followed by England, China and Australia. The image above shows that publications related to this topic are still very rare. This shows that this topic allows for further development. The relationship between this research topic and frequently used variables can be seen from the image of the results of data analysis using the Vosviewer application below:

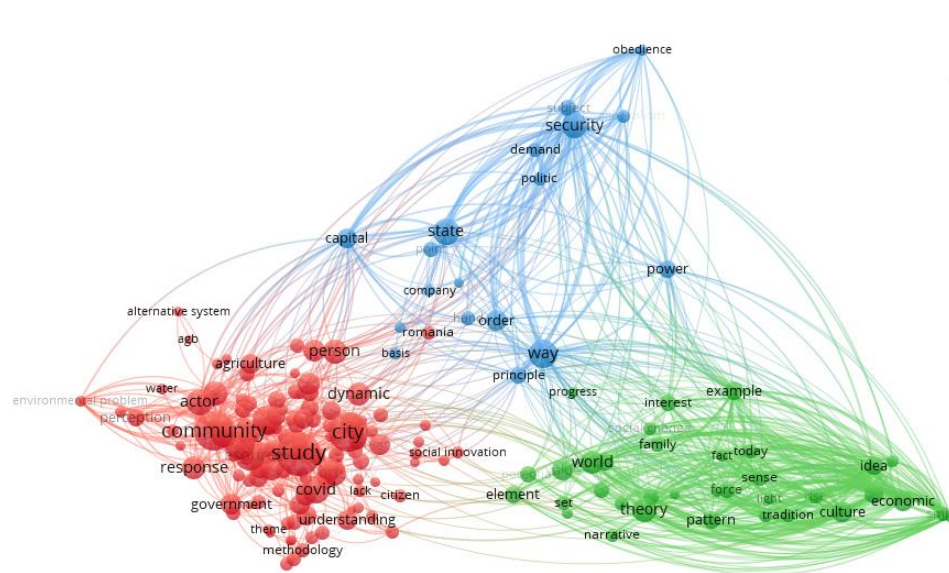


Figure 3. Results of Vosviewer literature review of publications on the topic of social resilience and economic transformation (sources: Scopus.com 2023)

Figure 3 explains that the topics of social resilience and economic transformation in publications are associated with various variables by forming clusters which are differentiated by different colors. In a cluster, social resilience and economic transformation are linked to community, study, agriculture, government, etc. In different clusters, social resilience and economic transformation are associated with family, tradition, culture, sense, etc. In other clusters, social resilience and economic transformation are linked to security, power, politics, compliance, etc. Figure 3 shows that social resilience and economic transformation can cover various aspects of life, making it an urgent topic for further research and development.

3. METHODOLOGY

Both qualitative and quantitative methods were applied in this investigation. The Nicholson McBride Resilience Questionnaire (NMRQ), which consists of 12 questions with a minimum score of 0 and a maximum score of 60, was modified to measure the resilience of children. The scores range from 0-37 for "developing," 38-43 for "established," 44-48 for "strong," and 49-60 for "exceptional." Based on concerns to assess children's resistance during the Covid-19 pandemic, the NMRQ tool was used.

Purposive sampling was the method of sampling that was employed in this investigation; the sample was chosen in accordance with the parameters that the researchers had established. The participants had to meet certain requirements in order to be included: they had to be enrolled students in batik industry and basic batik education programs in Indonesia, actively engaged in their studies at formal educational institutions, and willing to respond to an approval letter provided by the UNS-UMPO.

Additionally, the SAJA questionnaire (2018), which includes variables to measure social structure such as social and economic position, health status, educational attainment, and

living conditions at home, was used to measure the elements that influence children's resilience. Nine questions make up the SAJA questionnaire, and the details range from 1-3: Never, 4-6: Rarely, 7-8: Sometimes, and 9-10: Always on a Likert scale (Creswell & Creswell, 2017). Because ordinary least squares and causality analysis work with ordinal data types, they were utilized to determine the relationship between social structure and resilience (Creswell & Creswell, 2017). Prior to the gathering of data, 115 individuals, including their parents, gave their agreement to the researchers. Furthermore, the investigator has communicated the study goals to the participants before employing SmartPLS to compute and handle the information.

Econometric Modelling :

$$NMRQ = \alpha + \beta_1 To_1 + \beta_2 Pe_2 + \beta_3 SC_3 + \beta_4 Co_4 + e$$

α	: Constanta
$\beta_1 - \beta_4$: Regression coefficient
e	: Error
To	: Toughness
Po	: Personality
SC	: Self Confident
Co	: Composure

4. RESULTS AND DISCUSSION

Result

Descriptive statistical results show the respondents' answers. The following are presented the results of descriptive perceptual statistics of research respondents:

Table 1. statistic descriptive

	Mean	Median	Observed min	Observed max	Standard deviation	Number of observations used
X11 Pengaruh	3,952	4,000	1,000	5,000	0,987	84,000
X12 Kritik	2,405	2,000	1,000	5,000	0,977	84,000
X13 Cara	4,179	4,000	1,000	5,000	0,847	84,000
X21 Krisis	3,881	4,000	1,000	5,000	1,005	84,000
X22 Solusi	4,369	4,000	3,000	5,000	0,552	84,000
X23 TdkGelisah	4,143	4,000	2,000	5,000	0,742	84,000
X31 Konflik	3,798	4,000	1,000	5,000	1,009	84,000
X32 Atasi	4,405	4,000	4,000	5,000	0,491	84,000
X33 Intuisi	4,190	4,000	1,000	5,000	0,763	84,000
X41 KelolaStres	4,250	4,000	2,000	5,000	0,615	84,000
X42 Konfiden	4,274	4,000	3,000	5,000	0,542	84,000
Y Inovasi	3,429	3,000	2,000	5,000	0,562	84,000

Source: data is processed (2023)

Table 1 above shows that for the business resilience variable, the highest answer is Method, with an average of 4.179. In the Personality variable, the highest answer is in Solution, with an average number of 4.369. In the Confidence variable, the highest answer is Overcoming, with an average of 4.405. In the variable Calmness in business, the highest answer is Confidence, with an average number of 4.274. The table above also shows that in general the Batik Ciprat business has implemented its business strategy well. Furthermore, following table 2, the results of the significance effect test are presented:

Table 2. Result of Regression Analysis

	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
Kepribadian -> Y Inovasi	0,287	0,097	2,873	0,004
Ketangguhan -> Y Inovasi	0,365	0,075	5,052	0,000
Ketenangan -> Y Inovasi	0,234	0,111	2,029	0,043
Percaya Diri -> Y Inovasi	0,198	0,093	2,245	0,025

Source: data is processed (2023)

The table 2 above shows that overall, the variables used in this research provide an acceptable level of significance, namely below 0.05. Individually, the Toughness variable has the highest significance level, namely 0.000, while the Calmness variable has the lowest significance level, namely 0.043. The following are the test results with the SmartPLS Application:

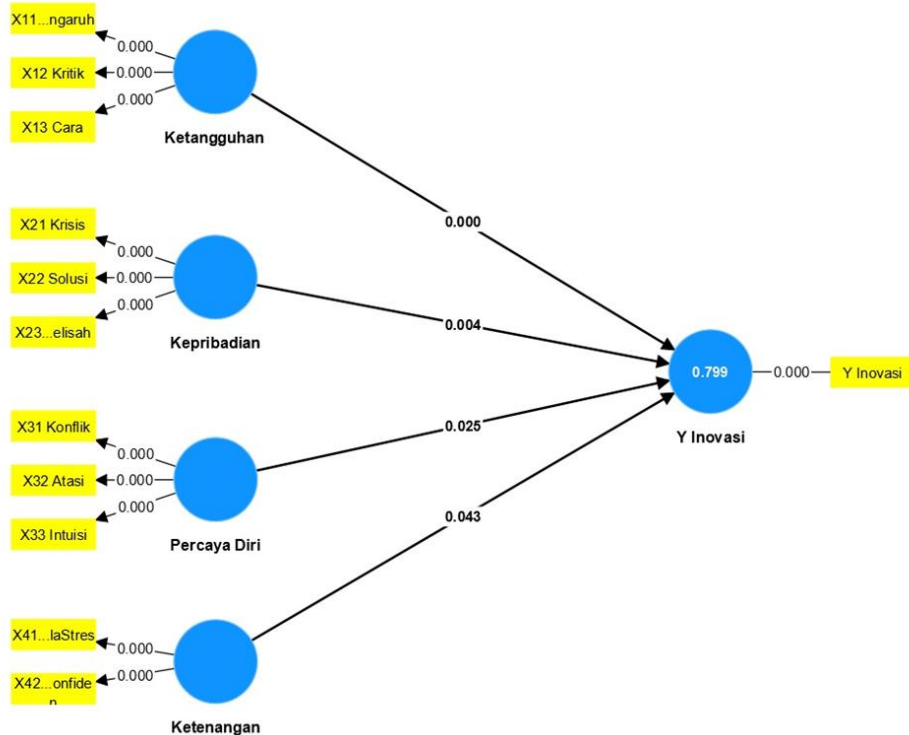


Figure 4. Results of SmartPLS Test

Based on result analysis that all Batik Industry (SMEs) have strong social resilience scores. Social resilience (strong level) means that Batik Industry are able to learn in a stable (absorb) and flexible (adaptive) during a pandemic period with changes in the learning system that are far different from before (transformational capacity)(Gordon, 1968). This is influenced by the implementation of learning which is able to attract

attention to learning and build intrinsic and extrinsic learning motivation post the pandemic so that it has a positive impact on the development of batik industry social resilience.

$$\text{NMRQ} = 6.932485 + 2.934821 \text{ To} + 4.234895 \text{ Pe} + 2.834928 \text{ SC} + 2.583295 \text{ Co}$$

The factor that most influences batik industry resilience is the personality status. personality status and NMRQ have a positive relationship with a probability value of 0.0000 or 0%, which means that personality status affects NMRQ. With the coefficient value owned by the personality status of 4.234895, it means that if the Pe increases by 1 level, the NMRQ increases by 4.234895. On the other hand, if the personality status decreases by 1 level, then NMRQ will decrease by 4.234895. In Maslow's theory of needs and research results from (Masten & Barnes, 2018), personality is at the level of primary needs on physical needs. When these basic needs have been met, the children's self-actualization in learning will be achieved and will have an impact on their strong level of resilience when learning post a pandemic and vice versa.

Discussion

Toughness

Resilience in business by providing a positive influence on the development of Batik Ciprat innovation. Resilience in this context refers to the ability to withstand various negative influences, face criticism, and the methods used to deal with changes and developments in the business environment (Lee, 2020). Meanwhile, innovation development includes the process of creating and implementing new ideas that can improve business performance and competitiveness. Resilience requires flexibility and adaptation to the effects of changes in the business environment. Ciprat Batik Business is able to identify innovation opportunities and adapt to market changes. Collaboration with external parties, such as business partners, research institutions, or the industrial community, also increases innovation capacity and resilience. The culture of the Batik Ciprat business that supports creativity, experimentation and risk taking is the key to encouraging innovation.

Resilience involves Batik Ciprat's business ability to manage criticism and manage risks, so that it is more likely to take controlled risks in an effort to develop innovative solutions. Innovation development does not always run smoothly, and often involves receiving criticism and feedback. Strong self-confidence can help individuals or teams to accept criticism better and see it as an opportunity to learn and improve their innovation. Batik Ciprat businesses also tend to respond quickly to feedback from customers or the market, allowing for necessary adjustments to improve or modify innovation. Ciprat Batik Business has good learning abilities (Muhibuddin et al., 2021). They can learn lessons from failures, implement changes, and continuously improve the quality of their innovation. Ciprat Batik Business is able to allocate resources for innovative research and development without being too affected by short-term pressures. In terms of using technology, Batik Ciprat is able to adopt new technology and have a good understanding of industry trends so that it can increase innovative capacity and organizational resilience.

Calmness can also contribute to the level of resilience to failure. In the development of innovation, failure is possible, and composure helps individuals to see failure as an opportunity to learn and grow. In order to achieve sustainable growth, Ciprat Batik Business combines resilience with the ability to innovate continuously. Thus, developing innovation is one of the key strategies to strengthen the resilience of the Batik Ciprat business. This is in line with Fey & Kock (2022) and Bangerter & Endrissat (2022).

Personality

Personality in business has a positive impact on the development of Batik Ciprat business innovation. Batik Ciprat's business capabilities have been formed in order to face crises

and manage change. An adaptive personality and the ability to manage change well can help the smooth implementation of innovation in business structures and processes. Personality in understanding customer needs, listening to feedback, and being oriented towards solutions that provide added value for customers can be the key to developing innovations that are relevant and useful. A good communication personality can help convey innovative ideas clearly to the team and other stakeholders. Effective communication is needed to ensure that the innovative vision is understood and applied consistently to the Batik Ciprat business.

A creative personality tends to encourage Batik Ciprat's efforts to think outside the box, look for new solutions, and identify innovative opportunities. The Batik Ciprat business is open to new experiences and has the ability to imagine so that it becomes the main driver in developing innovation in business. A personality that encourages cooperation and is open to other people's ideas can create an environment where collaboration and the exchange of ideas occur smoothly. This can enrich the innovation process and bring diverse perspectives to solving problems. Ciprat Batik Business also has an awareness of risk so it tends to be more willing to try new things and innovate. A personality open to risk can be a key factor in creating an environment where innovative ideas can be tested and implemented. A personality that has the resilience to fail, the ability to learn from mistakes, and try again with a different approach can be a valuable asset in developing successful innovations in the Batik Ciprat business. Thus, personality in business can form a culture of innovation within the company, motivating them to think creatively, take measured risks, and work together to create innovative solutions that can increase business competitiveness. This is in line with Runst & Thomä (2021) and Cao et al. (2022).

Self-confident

Confidence in facing conflict and business failure has a positive impact on the development of Batik Ciprat business innovation. The innovation process is not always successful on the first try, and strong self-confidence can help to bounce back after facing failure and continue looking for innovative solutions. Confidence can encourage collaboration among team members. When individuals are confident in their contributions, they may be more open to collaboration and sharing innovative ideas, which can enrich the innovation development process.

Having self-confidence can help individuals or Batik Ciprat business teams to face challenges and obstacles that may arise during the innovation development process. Confidence in one's own abilities is a driving force for finding creative solutions and trying new approaches. Confident people tend to be freer to think creatively and design solutions that are outside conventional boundaries. They are better able to combine new ideas with confidence in their own abilities to create unique solutions. Self-confidence also fosters intuition in managing risks better. When someone is confident in their ability to overcome risk, they may be more willing to take the risks necessary to create innovation. Developing innovations often involves steps that have never been attempted before, and self-confidence can be an asset for managing uncertainty. Self-confidence also plays a role in marketing innovative ideas. Confident individuals tend to be able to convey their vision clearly and convincingly. This is especially important when trying to convince teams, customers, investors, or other stakeholders to support or invest in those innovative ideas. Thus, self-confidence can be a key factor in encouraging Batik Ciprat's business to take innovative steps, manage risks wisely, and accelerate the innovation development process in a business context. This is in line with Srinivasan & Schoon (2023) and Fey & Kock (2022).

Calm

Calmness in business has a positive impact on the development of Batik Ciprat business innovation. Calmness helps individuals to maintain a calm and reflective mind especially

in managing stress. In the context of innovation development, this can enable them to better understand the challenges faced, analyze the situation and carefully design innovative solutions. Innovation development often involves stress and high levels of uncertainty. Calmness helps individuals to manage stress more effectively, so they can stay focused on innovative goals without being affected by external pressures. Calmness can play an important role in decision making. In the development of innovation, strategic decisions must be made, and calm can help individuals to make more thoughtful and informed decisions than if they were caught in a stressful atmosphere. Calmness helps individuals to stay focused on finding solutions rather than getting caught up in existing problems. This allows the Batik Ciprat business innovation team to face challenges more calmly, look for creative solutions, and remain focused on innovative development goals (<https://entrepreneur.nyu.edu>).

Calmness can help direct creativity to be more focused. With a calm mood, individuals tend to be more able to think creatively and produce innovative ideas that can solve problems or meet market needs. Calmness can improve communication skills, where clear and effective communication is very important for conveying innovative ideas to teams, customers, investors and other related parties. Composure helps someone to convey messages more clearly and persuasively. Thus, calm can create an environment that supports the development of innovation by helping individuals to think creatively, manage stress, and make good decisions in the Batik Ciprat business. This can help ensure that the innovation process runs smoothly and innovative goals can be better achieved (<https://www.americanexpress.com>) . This is in line with Gallo et al. (2023) and Kodama (2019).

5. CONCLUSION

Strong levels showed that most batik industry were able to build resilience and changed their perceptions from difficult conditions to acceptable learning conditions. The most influential factor for developing a strong level of resilience is personality status. The results of this preliminary study are used to create a conducive learning environment to strengthen the social resilience of students in several Batik Industry and Communities in Indonesia.

AUTHOR CONTRIBUTIONS

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Formal analysis: Siti Arifah

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Writing – original draft: Endang Dwi Amperawati, Siti Arifah, Rochmat Aldy Purnomo

Writing – review & editing: Siti Arifah, Rochmat Aldy Purnomo

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References

- Al Hakim, R. T. Y. (2021). *Pembelajaran Online di Tengah Pandemi Covid-19, Tantangan yang Mendewasakan* (Antologi Esai Mahasiswa Pendidikan Bahasa Inggris). UAD PRESS.
- Bangerter, E., & Endrissat, N. (2022). Resilience through Innovation: The Promise and Pitfalls of Agility for Innovation. In *Resilienz durch Organisationsentwicklung: Forschung und Praxis* (pp. 121–137). Springer Fachmedien Wiesbaden Wiesbaden.
- Cao, Y., Asad, M. M., Wang, L., Naz, A., & Almusharraf, N. (2022). Role of personality traits for entrepreneurial intentions of young entrepreneurs: A case study of higher education institution. *Frontiers in Psychology*, 13, 6045.
- Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.
- Erikson, E. H. (1993). *Childhood and society*. WW Norton & Company.
- Fey, S., & Kock, A. (2022). Meeting challenges with resilience—How innovation projects deal with adversity. *International Journal of Project Management*, 40(8), 941–950.
- Gallo, P. J., Sosa, S., & Velez-Calle, A. (2023). Business for peace: How entrepreneuring contributes to Sustainable Development Goal 16. *BRQ Business Research Quarterly*, 26(1), 62–78.
- Gordon, C. (1968). Systemic senses of self. *Sociological Inquiry*, 38(2), 161–178.
- Jeans, H., Castillo, G. E., & Thomas, S. (2017). *Absorb, adapt, transform: Resilience capacities*.
- Kodama, M. (2019). Business innovation through holistic leadership—developing organizational adaptability. *Systems Research and Behavioral Science*, 36(4), 365–394.
- Lee, Y. N. (2020). The pandemic's effect on Education is not being discussed enough says Education minister. Singapore Summit, CNBC.
- Masten, A. S., & Barnes, A. J. (2018). Resilience in children: Developmental perspectives. *Children*, 5(7), 98.
- Muhibuddin, F., Aldy, P. R., Utami, D. D., Arifin, R., Arnab, S., Wimpenny, K., & Richard, T. (2021). Measuring Early-Primary Students Resilience through Playful Learning. *Proceedings of the 2nd Borobudur International Symposium on Humanities and Social Sciences, BIS-HSS 2020*, 18 November 2020, Magelang, Central Java, Indonesia.
- Piaget, J. (1971). *The theory of stages in cognitive development*.
- Reivich, K., & Shatté, A. (2002). *The resilience factor: 7 essential skills for overcoming life's inevitable obstacles*. Broadway books.
- Runst, P., & Thomä, J. (2021). Does personality matter? Small business owners and modes of innovation. *Small Business Economics*, 1–26.
- Srinivasan, J., & Schoon, M. (2023). Recovery or continued resuscitation? A clinical diagnosis of Colorado River sub-basin recovery programs. *Ecology and Society*, 28(1).