International Journal of Research and Community Empowerment *Vol 03, No 01, 1-7*
e-ISSN: 2985-6175 *https://doi.org/10.58706/ijorce*
ijorce.mep@gmail.com

The Higher Education Curriculum in the Era of Industrial Revolution 4.0: A Review on Economic Education at the State University in Malang and Surabaya

Almas Zerlina Benita [1,*] and Jun Surjanti [1]
[1] Prodi S2 Pendidikan Ekonomi, Universitas Negeri Surabaya, Surabaya, Indonesia
[*] Email: benitaalmas@gmail.com

Abstract

The Industrial Revolution 4.0 demands that higher education institutions adapt their curricula to produce graduates with essential skills in data literacy, technological literacy, and human literacy. This study aims to analyze the curriculum adjustments made by State University in Malang and Surabaya in the field of Economic Education. Using a literature review methodology, the study draws upon national and international journal articles to examine the design, implementation, and evaluation of the Economic Education curricula at both universities. The findings indicate that both institutions have successfully integrated innovative teaching methods and aligned their curricula with the principles of the Merdeka Belajar Kampus Merdeka (MBKM) initiative. This curriculum adaptation ensures that graduates are equipped with the necessary competencies to navigate and succeed in a rapidly evolving global economy. The research provides insight into the ongoing curriculum reform efforts and offers recommendations for future studies to evaluate the long-term impact of these changes on graduate employability and industry relevance.

Keywords: Higher Education, Curriculum, Industrial Revolution 4.0, Economic Education
SDGs: Goal 4 (Quality Education)

Manuscript History
Received: 3 December 2024 Revised: 3 January 2025 Accepted: 17 February 2025

How to cite:
Benita, A.Z. & Surjanti J. (2025). The Higher Education Curriculum in the Era of Industrial Revolution 4.0: A Review on Economic Education at State University in Malang and Surabaya. *International Journal of Research and Community Empowerment*, **3**(1), 1-7. DOI: https://doi.org/10.58706/ijorce.v3n1.p1-7.

INTRODUCTION

The dawn of the Industrial Revolution 4.0 has ushered in a new era defined by technological innovation, automation, artificial intelligence (AI), and the interconnection of systems that have disrupted industries and societies worldwide (Roux, 2020). This revolution has not only transformed the global economy but also placed new demands on the education system. In particular, universities face the critical challenge of preparing graduates who are equipped with the skills and knowledge necessary to thrive in this fast-evolving landscape (Fantinelli et al., 2024). As industries are becoming increasingly automated and reliant on advanced technologies, higher education institutions must ensure that their curricula evolve in line with these developments (Yilmaz et al., 2017). This dynamic context requires a reevaluation of how academic programs are designed, particularly in fields like Economics, which traditionally focused on theoretical foundations but now needs to integrate practical, technology-driven competencies (Bongomin et al., 2020).

In Indonesia, two of the leading universities, Universitas Negeri Malang and Universitas Negeri Surabaya, have been making significant strides in curriculum reform (Faisal et al., 2020). These institutions recognize the need to equip their students with not only a solid grounding in economic theory but also the practical skills required in a world where digital technologies and AI are reshaping the economic landscape. Previous studies have explored curriculum reforms in various disciplines, highlighting the importance of adaptability and the integration of modern skills in education. For instance, research by (Ghemawat, 2009)on business education emphasizes the need for students to be adaptable and technologically literate. However, the specific adaptation

of Economic Education programs in response to the Industrial Revolution 4.0 has been relatively under-explored. This gap in the literature is significant, as understanding how Economic Education is evolving can provide insights into how universities can better align their curriculum with future job market demands (Aljohani et al., 2022).

In particular, the challenge for Economic Education lies in bridging the gap between traditional economic theories and the practical, hands-on skills needed in an increasingly digitalized world. The traditional approach to Economics education, focusing primarily on abstract models and theories, is now seen as insufficient in preparing students for careers that require them to analyze big data, engage in economic modeling using advanced software, and understand the impacts of emerging technologies like blockchain and AI (Biswas et al., 2020; Kurtzke & Setkute, 2021). To address this, universities such as Universitas Negeri Malang and Universitas Negeri Surabaya have begun integrating more technology-driven content into their programs, from introducing data analytics to incorporating real-world case studies that reflect the challenges and opportunities of the digital economy (Larson & Miller, 2011) This study aims to examine how these curriculum reforms are being implemented at both institutions and to assess their effectiveness in preparing students for the demands of the Industrial Revolution 4.0.

Despite the growing body of research on curriculum reform in various disciplines, there is a lack of focused studies on the specific needs of Economic Education within the context of Industry 4.0. Previous research by (Owoc et al., 2021) on the evolution of business education highlights the importance of practical skills, but there is little focus on how these strategies are being applied within the Economic Education sector in Indonesia. Furthermore, while research on the integration of technology in education has been conducted, there is a need for more targeted studies that explore how these technologies are being utilized specifically in the field of Economics to equip students with future-proof skills. This gap in the literature highlights the importance of this study, which aims to fill the void by analyzing the curriculum adjustments made by Universitas Negeri Malang and Universitas Negeri Surabaya, providing a case study of how Economic Education can evolve to meet the challenges of the 21st century.

The primary objective of this study is to evaluate the curriculum design, implementation, and outcomes of Economic Education programs at Universitas Negeri Malang and Universitas Negeri Surabaya in relation to Industry 4.0. Specifically, the study will explore how the integration of new technologies, practical skill-building, and industry collaboration is reshaping these programs. By analyzing the strengths and weaknesses of the current curriculum reforms, this research seeks to offer recommendations for further enhancing Economic Education programs, ensuring that graduates are not only academically capable but also equipped with the skills and competencies demanded by the rapidly changing global economy.

METHOD

This study utilizes a literature review methodology combined with document analysis, which is particularly suitable for exploring curriculum development and educational reforms within the context of the Industrial Revolution 4.0 (Devi et al., 2020). This methodological approach allows for an in-depth examination of existing academic articles, policy documents, institutional reports, and other relevant sources to identify patterns, trends, and gaps in the curriculum development of Economic Education programs at Universitas Negeri Malang and Universitas Negeri Surabaya. The research will follow a structured process as outlined on Figure 1.

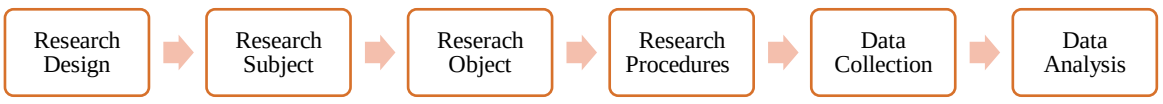

Figure 1. Research Flow Chart

The study adopts a qualitative research design aimed at understanding the complexities of curriculum adaptation in higher education within the context of rapid technological advancements. It focuses on a comparative analysis of curriculum reforms at two prominent Indonesian universities, namely Universitas Negeri Malang and Universitas Negeri Surabaya. The research examines their responses to Industry 4.0 demands in Economic Education. By analyzing these curriculum changes, the study aims to provide insights into how higher education institutions adapt to technological advancements.

The primary subjects of this research include curriculum developers, faculty members, and academic stakeholders involved in designing, implementing, and evaluating Economic Education programs at both

universities. These individuals play a crucial role in shaping and assessing curriculum changes. Their perspectives and experiences will provide valuable insights into the effectiveness of these reforms. Additionally, curriculum committees and academic boards will be included to understand decision-making processes in curriculum development.

The research objects consist of curriculum documents from both universities, policy documents related to higher education reforms, and relevant journal articles. One key policy analyzed is the Merdeka Belajar-Kampus Merdeka (MBKM) program, which significantly influences curriculum adaptation. National and international journal articles discussing curriculum adaptation in response to Industry 4.0 will also be reviewed. These materials will provide the necessary data to evaluate the integration of modern technological competencies in the curriculum.

The research procedures involve several steps to ensure a comprehensive analysis. First, curriculum documents and syllabi will be collected from both universities to examine the existing content and teaching methodologies. Next, secondary data, such as journal articles, policy guidelines, and faculty reports, will be gathered. Then, document analysis will be conducted using a thematic approach to identify key themes, challenges, and trends in curriculum adaptation. Finally, a comparative analysis will be performed to highlight common themes, best practices, and areas requiring improvement.

Data collection will include curriculum documents from official academic departments, journal articles from national and international sources, and policy documents issued by the Indonesian Ministry of Education and Culture. Additionally, internal reports and evaluations from faculty members and academic stakeholders will provide context on curriculum effectiveness. These sources will allow for a thorough examination of how Economic Education programs are responding to Industry 4.0.

Data analysis will be conducted using thematic analysis to identify patterns and trends in curriculum adaptation. A comparative approach will be employed to contrast the strategies used by both universities. This will help evaluate how well their curricula align with Industry 4.0 competencies. Furthermore, a gap analysis will be performed to assess whether current curricula adequately prepare students for technological advancements or require further reforms.

The research process follows a structured flow to ensure systematic examination. It begins with qualitative research focusing on document analysis and thematic coding. Data collection then involves gathering relevant documents and secondary sources. This is followed by document analysis to extract recurring themes and patterns. Comparative analysis is conducted to identify similarities and differences between the two universities. Lastly, gap analysis determines the extent to which curricula align with Industry 4.0, guiding recommendations for improvement.

This methodological framework ensures a comprehensive and systematic examination of how Economic Education programs are adapting to the challenges and opportunities of the Industrial Revolution 4.0. By understanding these curriculum changes, the study aims to contribute valuable insights into higher education reforms in Indonesia. The findings will help academic institutions develop more responsive and future-ready Economic Education programs.

RESULTS AND DISCUSSION

The results from the analysis of the curriculum development efforts at Universitas Negeri Malang and Universitas Negeri Surabaya indicate a robust alignment of their programs with the demands of the Industrial Revolution 4.0. Both institutions have made considerable strides in reshaping their Economic Education curricula to better equip students with the skills required in today's digitalized, interconnected world (Mateo-Berganza et al., 2022). This shift is critical as the evolution of economies driven by automation, AI, and big data requires that educational institutions prepare their graduates for complex, tech-driven professional environments (Morandini et al., 2023).

The curriculum design at Universitas Negeri Malang and Universitas Negeri Surabaya strongly reflects the principles of Competency-Based Education (CBE). Both universities have developed a framework where the curriculum is structured around the development of specific competencies that align with industry needs. This approach moves beyond traditional knowledge acquisition and focuses on ensuring that graduates possess practical, industry-relevant skills such as digital literacy, problem-solving, critical thinking, and interdisciplinary teamwork (Anurogo et al., 2023; Zamiri & Esmaeili, 2024). The integration of these competencies is vital, as they enable students to adapt quickly to the rapidly changing job market, characterized by technological advancements and the growing prevalence of automation (Coombs et al., 2020; Ghosh et al., 2015).

The inclusion of digital literacy as a core component of the curriculum is a key finding. At both universities, courses have been designed to incorporate digital tools and data analytics, areas that are becoming indispensable in economic analysis. Moreover, interdisciplinary course options that bridge economics with fields such as data science, engineering, and business management have been introduced (Omodan, 2024). This reflects the growing importance of interdisciplinary collaboration in tackling real-world problems that are increasingly shaped by technological factors (Nwulu et al., 2023).

Both Universitas Negeri Malang and Universitas Negeri Surabaya have prioritized experiential learning as a crucial element of their curriculum reforms. Internships, community engagement, and industry-based projects provide students with opportunities to apply theoretical knowledge in practical settings. This hands-on approach not only enhances students' problem-solving abilities but also helps them develop critical interpersonal skills such as teamwork and communication, which are highly valued by employers (Boelens et al., 2017). Industry partnerships play a significant role in this process, offering students exposure to real-world challenges and allowing them to learn from professionals who are at the forefront of technological innovation

The collaboration with industries and government agencies has also provided students with opportunities to work on projects that are directly relevant to current industry needs, bridging the gap between academia and practice. This has been seen as a crucial step in making higher education more responsive to the needs of the job market, which is increasingly influenced by advancements in AI, big data, and machine learning (Sreenivasan Jayashree et al., 2019). Research by Cummings (2016) highlights the importance of such partnerships in fostering practical skills and aligning academic programs with industry demands.

The implementation of blended learning methods, combining both online and offline instruction, has emerged as a significant innovation in the curriculum at both universities. This mode of delivery maximizes accessibility and ensures that students can engage with the curriculum in ways that fit their learning styles and schedules. Blended learning also increases the flexibility of the program, allowing it to accommodate students from diverse backgrounds and with different levels of technological proficiency (Garrison & Kanuka, 2004).The shift to blended learning reflects broader trends in higher education, where online learning tools are being integrated into traditional classroom settings to enhance the learning experience .

This approach not only supports students' digital literacy development but also prepares them for the digital workplace, where remote work and the use of digital collaboration tools are becoming the norm. Furthermore, the ongoing professional development of faculty members is essential in ensuring that instructors are well-equipped to deliver updated, technology-integrated content. Faculty engagement in training programs also ensures that teaching methodologies remain aligned with the evolving demands of the labor market and technological advancements (Guskey, 2014). Both universities have implemented a rigorous process of curriculum evaluation, involving feedback from students, alumni, faculty, and industry representatives. This continuous feedback loop is essential in ensuring that the curriculum remains relevant and responsive to the changing demands of the workforce. The feedback obtained is used to make regular adjustments, refining the curriculum to address any emerging gaps or areas of improvement (Nicol, 2010).

The inclusion of career tracking systems has been another positive development, helping universities track the career progress of graduates and identify skills gaps that may still exist within the curriculum. This allows for data-driven decisions about curriculum adjustments, ensuring that the educational outcomes remain aligned with industry expectations (Fry, et al, 2009). However, it should be noted that while the curriculum at Universitas Negeri Malang and Universitas Negeri Surabaya has shown positive outcomes in enhancing students' analytical thinking and problem-solving skills, there remains room for improvement, particularly in fostering entrepreneurial skills. This finding aligns with other research, which suggests that while technical skills are prioritized, entrepreneurial and leadership training should be integrated more systematically into academic programs (Li et al., 2024).

The findings of this research align with previous studies on curriculum reform in the context of Industry 4.0. For instance, work by Siagian & Muliawati (2021) on curriculum adaptation in the Indonesian higher education system highlighted the importance of integrating digital competencies into university programs to prepare graduates for the demands of the modern job market. Similarly, studies by Satar (2020) and Nair (2020) emphasize the necessity of adopting competency-based approaches that focus on practical, hands-on learning to ensure that graduates are equipped with the skills needed to succeed in a highly automated and interconnected world. The results of this study reaffirm the relevance of these approaches in shaping the future of higher education in Indonesia.

The findings of this research have several important implications. By examining the curriculum developments at Universitas Negeri Malang and Universitas Negeri Surabaya, this study highlights the

importance of adaptability and innovation in higher education programs. It provides valuable insights for other universities looking to adapt their curricula to the demands of the Industrial Revolution 4.0. The integration of digital literacy, interdisciplinary skills, and experiential learning can serve as a model for other institutions aiming to improve their educational offerings.

Moreover, the research underscores the necessity of continuous collaboration with industries and government entities to ensure that academic programs remain aligned with the needs of the labor market. The study also emphasizes the importance of ongoing professional development for faculty members, enabling them to stay up-to-date with technological advancements and incorporate relevant content into their teaching.

CONCLUSION

In conclusion, the curriculum reforms at Universitas Negeri Malang and Universitas Negeri Surabaya demonstrate a forward-thinking approach to addressing the challenges and opportunities presented by the Industrial Revolution 4.0. The integration of digital tools, interdisciplinary skills, experiential learning, and industry collaboration has positioned these institutions at the forefront of educational innovation. However, as the landscape continues to evolve, continuous evaluation and adaptation of the curriculum will be crucial in ensuring that graduates are well-prepared for the demands of the modern economy.

ACKNOWLEDGEMENT

This study was supported by Universitas Negeri Malang and Universitas Negeri Surabaya. Special thanks to the faculty members and academic staff for providing valuable insights and resources for this research. The authors also express gratitude to the Ministry of Education and Culture for policy guidance on MBKM implementation.

AUTHOR CONTRIBUTIONS

Almas Zerlina Benita: Methodology, Formal Analysis, Investigation, Writing - Original Draft, and Writing - Review & Editing; and Jun Surjanti: Conceptualization, Supervision, and Writing - Review & Editing

DECLARATION OF COMPETING INTEREST

The authors declare no known financial conflicts of interest or personal relationships that could have influenced the work reported in this manuscript.

DECLARATION OF ETHICS

The authors declare that the research and writing of this manuscript adhere to ethical standards of research and publication, in accordance with scientific principles, and are free from plagiarism.

DECLARATION OF ASSISTIVE TECHNOLOGIES IN THE WRITING PROCCESS

The authors affirm that Generative Artificial Intelligence and other assistive technologies were not excessively utilized in the research and writing processes of this manuscript.

REFERENCES

Aljohani, N.R., Aslam, A., Khadidos, A.O., & Hassan, S.U. (2022). Bridging the Skill Gap Between the Acquired University Curriculum and the Requirements of the Job Market: A Data-Driven Analysis of Scientific Literature. *Journal of Innovation and Knowledge*, **7**(3), 100190. DOI: https://doi.org/10.1016/j.jik.2022.100190.

Anurogo, D., Ramba, H.L., Putri, N.D., & Putri, U.M.P. (2023). Digital Literacy 5.0 to Enhance Multicultural Education. *Multicultural Islamic Education Review*, **1**(2), 109–179. DOI: https://doi.org/10.23917/mier.v1i2.3414.

Biswas, B., Roy, S.K., & Roy, F. (2020). Students Perception of Mobile Learning During Covid-19 in Bangladesh: University Student Perspective. *Aquademia*, **4**(2), ep20023. DOI: https://doi.org/10.29333/AQUADEMIA/8443.

Boelens, R., De Wever, B., & Voet, M. (2017). Four Key Challenges to the Design of Blended Learning: A Systematic Literature Review. *Educational Research Review*, **22**, 1–18. DOI: https://doi.org/10.1016/J.EDUREV.2017.06.001.

Bongomin, O., Yemane, A., Kembabazi, B., Malanda, C., Mwape, M.C., Mpofu, N.S., & Tigalana, D. (2020). Industry 4.0 Disruption and Its Neologisms in Major Industrial Sectors: a State of the Art. *Journal of Engineering (United Kingdom)*, **2020**, 8090521. DOI: https://doi.org/10.1155/2020/8090521.

Coombs, C., Hislop, D., Taneva, S.K., & Barnard, S. (2020). The Strategic Impacts of Intelligent Automation for Knowledge and Service Work: An Interdisciplinary Review. *Journal of Strategic Information Systems*, **29**(4), 101600. DOI: https://doi.org/10.1016/j.jsis.2020.101600.

Devi, M., Annamalai, M.A.R., & Veeramuthu, S.P. (2020). Literature Education and Industrial Revolution 4.0. *Universal Journal of Educational Research*, **8**(3), 1027–1036. DOI: https://doi.org/10.13189/ujer.2020.080337.

Faisal, Gi, G.M., & Martin, S.N. (2020). Analysis of Government-Funded Research in Indonesia from 2014-2018: Implications for Research Trends in Science Education. *Jurnal Pendidikan IPA Indonesia*, **9**(2), 146–158. DOI: https://doi.org/10.15294/jpii.v9i2.23174.

Fantinelli, S., Cortini, M., Di Fiore, T., Iervese, S., & Galanti, T. (2024). Bridging the Gap Between Theoretical Learning and Practical Application: A Qualitative Study in the Italian Educational Context. *Education Sciences*, **14**(2), 198. DOI: https://doi.org/10.3390/educsci14020198.

Fry, H., Ketteridge, F., & Marshall, S. (2009). *A Handbook for Teaching and Learning in Higher Education: Enhancing Academic Practice, Third Edition*. New York: Routledge.

Garrison, D.R., & Kanuka, H. (2004). Blended Learning: Uncovering Its Transformative Potential in Higher Education. *The Internet and Higher Education*, **7**(2), 95–105. DOI: https://doi.org/10.1016/J.IHEDUC.2004.02.001.

Ghemawat, P. (2009). Redefining Global Strategy: Crossing Borders in a World where Differences Still Matter. *Journal of International Business Studies*, **39**, 1091-1093. DOI: https://doi.org/10.1057/palgrave.jibs.8400414.

Ghosh, D., Sarkar, U., & De, S. (2015). Analysis of Ambient Formaldehyde in the Eastern Region of India along Indo-Gangetic Plain. *Environmental Science and Pollution Research*, **22**(23), 18718–18730. DOI: https://doi.org/10.1007/s11356-015-5029-y.

Guskey, T.R. (2014). Evaluating Professional Learning. In: Billett, S., Harteis, C., Gruber, H. (eds) *International Handbook of Research in Professional and Practice-based Learning*. Dordrecht: Springer, 1215–1235. DOI: https://doi.org/10.1007/978-94-017-8902-8_44.

Jayashree, C.A.S., Malarvizhi, & Reza, M.N.H. (2019). The Challenges and Opportunities of Industry 4.0-a Review. *Asia Proceedings of Social Sciences*, **5**(2), 173–178. DOI: https://doi.org/10.31580/APSS.V5I2.1152.

Kurtzke, S., & Setkute, J. (2021). Analytics Capability in Marketing Education: A Practice-informed Model. *Journal of Marketing Education*, **43**(3), 298–316. DOI: https://doi.org/10.1177/02734753211042404.

Larson, L. C., & Miller, T.N. (2011). 21st Century Skills: Prepare Students for the Future. *Kappa Delta Pi Record*, **47**(3), 121–123. DOI: https://doi.org/10.1080/00228958.2011.10516575.

Li, S., Bu, Y., Zhang, Z., & Huang, Y. (2024). Digital Entrepreneurship Intention and Digital Entrepreneurship Behavior: The Mediating Role of Managing Learning and Entrepreneurship Education. *Education and Training*, **66**(2–3), 195–212. DOI: https://doi.org/10.1108/ET-05-2023-0176.

Mateo-Berganza, M.M., Lim, R., Pellicer, C., López, E., Rodríguez, H., López, R., Margo, C., Vásquez, A., Quesada, A. V., Brooks-Young, S., Álvarez, X., Ramos, Y., Rivas, A., Barrenechea, I., Brãzo, V., Ndebele, V., Nathan, D., & Groot, B. (2022). *The Power of Curriculum to Transform Education: How Education Systems Incorporate 21st Century Skills to Prepare Students for Todays Challenges*. DOI: http://dx.doi.org/10.18235/0004360.

Morandini, S., Fraboni, F., De Angelis, M., Puzzo, G., Giusino, D., & Pietrantoni, L. (2023). The Impact of Artificial Intelligence on Workers' Skills: Upskilling and Reskilling in Organisations. *Informing Science*, 26(October 2024), 39–68. DOI: https://doi.org/10.28945/5078.

Nicol, D. (2010). From Monologue to Dialogue: Improving Written Feedback Processes in Mass Higher Education. *Assessment and Evaluation in Higher Education*, **35**(5), 501–517. DOI: https://doi.org/10.1080/02602931003786559

Nwulu, E.O., Elete, T.Y., Omomo, K.O., & Ayotunde, O. (2023). The Importance of Interdisciplinary Collaboration for Successful Engineering Project Completions : A Strategic Framework. *World Journal of Engineering and Technology Research*, **2**(3), 1-16. DOI: https://doi.org/10.53346/wjetr.2023.2.3.0048.

Omodan, B.I. (2024). Advancing Interdisciplinary Management Science: A Pathway to Sustainable Development Goals. *Interdisciplinary Journal of Management Sciences*, **1**, 1–9. https://doi.org/10.38140/ijms-2024.vol1.01.

Owoc, M.L., Sawicka, A., & Weichbroth, P. (2021). Artificial Intelligence Technologies in Education: Benefits, Challenges and Strategies of Implementation. *IFIP Advances in Information and Communication Technology*, **599**, 37–58. DOI: https://doi.org/10.1007/978-3-030-85001-2_4.

Roux, M. (2020). The Hype and Disruptive Technologies of Industry 4.0 in Major Industrial Sectors: A State of The Art. *Maturing Leadership: How Adult Development Impacts Leadership*, **1**(June), 7–35. DOI: https://doi.org/10.20944/preprints202006.0007.v1.

Yilmaz, İ.G., Aygün, D., Tanrikulu, Z., Yilmaz, İ.G., Aygün, D., & Tanrikulu, Z. (2017). Social Media's Perspective on Industry 4.0: A Twitter Analysis. *Social Networking*, **6**(4), 251–261. DOI: https://doi.org/10.4236/SN.2017.64017.

Zamiri, M., & Esmaeili, A. (2024). Strategies, Methods, and Supports for Developing Skills within Learning Communities: A Systematic Review of the Literature. *Administrative Sciences*, **14**(9), 231. DOI: https://doi.org/10.3390/admsci14090231.