



STRATEGIES FOR TRANSFORMING 21ST CENTURY EDUCATION TO REALISE COMPETITIVE HUMAN RESOURCES TOWARDS THE GOLDEN GENERATION: A LITERATURE REVIEW

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ABSTRACT

This research aims to examine 21st century education transformation strategies in an effort to realise competitive human resources (HR) towards Indonesia's golden generation. Through a literature review, this research highlights the importance of changing the educational paradigm, developing a competency and character-based curriculum, and utilising technology in the learning process. The transformation of 21st century education emphasises the mastery of critical thinking, creativity, communication and collaboration (4C) skills, as well as digital literacy as the main capital to face global challenges. Challenges identified include access gaps, limited infrastructure, resistance to change and the need to strengthen teacher capacity. Proposed solutions include strengthening teacher training, updating the curriculum, equalising access to technology and cross-sector collaboration. The results of the study show that an integrated and adaptive strategy is needed to produce human resources that are superior, innovative and characterised, so that they are ready to compete in the global era and contribute to realising the Golden Indonesia 2045.

Keywords: education transformation, 21st century, human resources, competitive, golden generation, digital literacy, curriculum, learning innovation.

INTRODUCTION

The transformation of 21st century education is a central issue in the development of superior and competitive human resources (HR), especially in facing global challenges and realising the vision of a Golden Indonesia 2045 (Tubagus et al., 2023). Educational transformation is the process of changing and adjusting the education system, both in terms of paradigms, methods, and technology, which is carried out to respond to the times, especially technological, social, and cultural advances, so that learning becomes more collaborative, student-centred, and able to develop 21st century skills such as creativity, critical thinking, communication, and collaboration in order to produce superior, adaptive, and competitive human resources in facing global challenges (Aslan & Shiong., 2023).

The 21st century is characterised by rapid advances in technology and information, demanding fundamental changes in the education system. Education is no longer only oriented towards the transfer of knowledge, but also on the development of critical thinking skills, creativity, collaboration, and communication or what is known as 4C (I. P. Rahayu, 2024).

In this new paradigm, students are encouraged to be active, creative and independent in the learning process. Teachers play a role as facilitators who guide students to discover and develop their potential optimally. This is in line with the increasingly complex demands of the world of work and community life, where adaptability and lifelong learning are very important (D. N. O. Rahayu, 2021).

Significant changes in education are also triggered by globalisation and the



industrial revolution 4.0, which has an impact on lifestyles, ways of thinking, and the need for new skills. 21st century education not only prepares students to compete at the national level, but also at the global level. Therefore, mastery of technology, digital literacy, and the ability to innovate are absolute requirements for future generations (Putra & Aslan, 2020) .

Indonesia is currently in the momentum of demographic bonus, where the number of productive age population is very large. This condition is a golden opportunity to encourage the nation's progress as long as it is supported by superior human resource quality. Educational transformation is the key to utilising this demographic bonus, so that Indonesia's young generation can become the driving force of national development towards a Golden Indonesia 2045 (Puspa et al., 2023).

Efforts to transform 21st century education in Indonesia have been realised through various policies, such as the development of competency and character-based curricula, the implementation of innovative learning models, and strengthening the role of teachers. The Merdeka Curriculum and the Mobilising Schools Programme, for example, are initiatives to encourage learning that is adaptive, creative, and relevant to the needs of the times (Fullan, 2020) . In addition, the learning process in the 21st century demands the integration of technology in every aspect of education. The use of information technology is not only as a tool, but also as the main media in the learning process and self-development of students. This requires teachers to continue to improve competence, especially in mastering Technological Pedagogical Content Knowledge (TPACK) (Scott, 2020) .

Good quality education will produce human resources who are not only intellectually intelligent, but also have strong

character, ethics and social skills. Character education is one of the main pillars in shaping a generation with integrity, competitiveness, and the ability to contribute positively to society and the nation. The challenges in transforming 21st century education are many. Gaps in access to technology, resistance to change, and limited resources are obstacles that must be overcome together. There is a need for collaboration between the government, educational institutions, communities and businesses to create a conducive and inclusive education ecosystem (Redecker, 2022) .

The transformation of 21st century education also requires continuous evaluation and adjustment of education policies and practices. Innovations in learning, curriculum development, and improving teacher competence must continue to be made so that education remains relevant to the times and the needs of society.

21st century education must be able to equip students with life skills, digital literacy, and adaptability in the face of rapid change. Thus, education graduates are expected to be not only ready to enter the world of work, but also able to become agents of change in society (Nurdiana et al., 2023) . The success of the transformation of 21st century education is highly dependent on the commitment of all parties in supporting change. The government needs to ensure policies that favour human resource development, while schools and teachers must be the main actors in the implementation of educational transformation in the field (Tuhuteru et al., 2023) .

Finally, the transformation of 21st century education is a long-term investment for the future of the nation. With an adaptive, innovative and characterful education, Indonesia has a great opportunity to give birth



to a golden generation that is able to compete in the global era and lead the nation to sustainable progress.

METHOD

The research method used in this research is a qualitative approach with a literature review method, namely collecting, examining, and critically analysing various relevant secondary sources such as books, journal articles, and research reports related to the transformation of 21st century education, in order to obtain a comprehensive understanding of effective strategies in realising competitive human resources towards the golden generation (Munn et al., 2020) ; (Eliyah & Aslan, 2025) .

RESULTS AND DISCUSSION

Strategies for Transforming 21st Century Education in Developing Human Resources with Character, Innovation, and Competitiveness

The 21st century education transformation strategy is the main foundation in efforts to develop human resources (HR) with character, innovation and competitiveness. This transformation does not only require changes in curriculum aspects, but also in paradigms, learning methods, and the use of technology that is relevant to the needs of the times. 21st century education emphasises the mastery of critical thinking, creativity, communication and collaboration (4C) skills as the main capital to face global challenges (Redecker, 2022) .

The implementation of a competency-based curriculum is one of the main strategies in educational transformation. This curriculum is designed to equip learners with the knowledge, skills, and character needed to be able to adapt to global changes and

competition. The Merdeka curriculum, for example, provides space for students to optimally develop their interests, talents, and potential through more flexible and learner-centred learning (Mishra & Koehler, 2020) .

Strengthening character education is a crucial aspect in shaping a generation that is not only intellectually intelligent, but also has integrity, ethics, and social responsibility. Character education is integrated into every subject and school activity, so that values such as honesty, discipline, hard work, and mutual cooperation become part of the school culture (Voogt & Pareja Roblin, 2021) . Learning innovation is needed to foster critical and creative thinking skills in students. Project-based learning and problem-based learning models encourage students to actively seek solutions, work together, and develop new ideas that are applicable in everyday life (Astutik, 2025)

The utilisation of educational technology is a catalyst in the transformation of learning. Technology allows the teaching and learning process to be more interactive, flexible and personalised, and opens access to wider learning resources without geographical restrictions. With technology, students can develop digital literacy, data analysis skills, and adaptation to the latest technological developments (Haddar et al., 2023) .

Teachers as agents of change play a central role in the transformation of 21st century education. Strengthening pedagogical, professional, social, and technological competencies for teachers is carried out through continuous training in order to be able to manage innovative learning and be relevant to the needs of students. Teachers are also encouraged to become facilitators who are able to guide students in



developing their potential and superior character (Astuti et al., 2023) .

Collaboration between schools, businesses and industries (DUDI) is an important strategy in developing competitive human resources. This collaboration opens up opportunities for students to get to know the world of work directly, do internships, and develop skills that are in line with current and future industry needs. Improving the managerial capacity of school staff is also part of the HR development strategy. Principals and education personnel are encouraged to have a clear vision, good managerial skills, and be able to create a conducive and innovative learning environment (Schleicher, 2021) .

A participatory and collaborative learning culture in the school environment is very important to shape character and improve student competitiveness. The habit of discussion, group work, and presentation encourages students to dare to argue, respect differences, and learn from each other's experiences (Rismana . , 2025)

New literacies, such as data literacy, technological literacy and human literacy, should be an integral part of the learning process. Data literacy equips students with the ability to read, analyse and utilise digital information, while technological literacy teaches understanding of technological applications and engineering principles, and human literacy emphasises communication, collaboration and creativity. Periodic evaluation and adjustment of the curriculum is needed so that education remains relevant to the times and the needs of society (Setyawan, 2025) . Evaluation is carried out by involving various stakeholders, including teachers, students, parents, and businesses, to ensure that the learning process is effective and adaptive to change. The support of adequate

facilities, both physical and digital infrastructure, is a major supporting factor for the success of educational transformation. Schools need to be equipped with laboratories, digital libraries, and adequate internet access to optimise the learning process (Murtafiah ., 2021)

The visionary leadership of school principals and school management determines the direction and success of educational transformation. Principals must be able to inspire, mobilise and empower all school members to jointly achieve 21st century education goals (Hifza, Juliana, et al., 2020) . Continuous training and development of teacher professionalism must be prioritised. Teachers need to be equipped with the latest knowledge and skills, both in pedagogic and technological fields, in order to be able to present learning that is interesting, effective and in accordance with the characteristics of students (Hifza, Suhardi, et al., 2020) .

Educational technology empowerment is not only limited to the use of hardware and software, but also to the development of relevant and quality digital content. Teachers and students are encouraged to become content producers, not just consumers, so as to create innovation in learning.

The implementation of a learning system that is adaptive and responsive to the needs of learners is key in creating innovative and competitive human resources. Differentiated and personalised learning allows each student to develop according to their own potential and learning pace (Rismana ., 2025)

Finally, the 21st century education transformation strategy must be holistic and integrated, involving all elements of education, from the curriculum, teachers, students, school management, to collaboration with the outside world. Thus, it is expected



that a golden generation with character, innovation and competitiveness will be born, ready to face global challenges and contribute to the nation's progress towards the Golden Indonesia 2045.

Challenges and Solutions for 21st Century Education Transformation Strategies in Developing Characterful, Innovative and Competitive Human Resources

The challenges of 21st century education transformation in developing human resources (HR) with character, innovation and competitiveness are complex and multidimensional. One of the main challenges is the gap in access to education, especially between urban and rural areas. Many schools in remote areas still face limitations in digital infrastructure, internet access and technology devices, thus widening the digitalisation gap in education (Pratama, 2021) . In addition, rapid technological change demands continuous adaptation from all elements of education. Many educators and education personnel do not have adequate digital skills, both in the use of hardware and learning support software. Lack of information and communication technology (ICT) training is a major obstacle in integrating technology into the teaching and learning process (Hayati, 2024) .

Resistance to change is also a significant challenge. Some educators and institutions are still comfortable with conventional learning patterns and are not ready to switch to technology-based systems. Changes in organisational culture and mindset are important prerequisites for digital transformation to be effective and widely accepted. Another challenge is limited budget and resources. The implementation of education technology requires large

investments in equipment procurement, infrastructure development, and teacher and staff training. Many schools, especially in less developed areas, struggle to fulfil these needs due to limited funding and technical support (Fitriani, 2025) .

Data security and privacy are also crucial issues in the digitalisation of education. The use of technology in learning increases the risk of student and institutional personal data leakage, hence the need for strong data protection systems and clear privacy policies. In addition to technical challenges, 21st century education also faces the challenge of adapting the curriculum to the needs of the future. Curricula that are still oriented towards memorisation and exams need to be reformed to place more emphasis on developing critical thinking skills, creativity, digital literacy, and other soft skills (Binkley et al., 2020) .

The role of teachers as agents of change also faces its own challenges. Teachers are required to always innovate, develop project-based learning methods, and be able to manage culturally, socially and economically heterogeneous classes. This requires increased professionalism and continuous self-development. Solutions to overcome these challenges must be holistic and collaborative (Johnson & Johnson, 2022) . The government needs to strengthen affirmative policies and equitable access to education, including the provision of digital infrastructure and technology device assistance to 3T (underdeveloped, frontier, and outermost) areas. Scholarship programmes and technology subsidies are also important to ensure inclusive education for all levels of society (Dede, 2021) .

Teacher training and professional development should be a top priority.



Teachers need to be equipped with technological, pedagogical and learning innovation skills through training, workshops and learning communities. Strengthening digital literacy must also be integrated into the curriculum from an early age so that students are ready to face global challenges. Regular curriculum updates are an important solution to keep education relevant to the times (Voogt & Pareja Roblin, 2021) . The curriculum should accommodate subjects based on digital skills, entrepreneurship, programming and data literacy. Interdisciplinary approaches and problem-based learning can help students develop critical thinking and innovation skills (Aslan & Wahyudin ., 2020)

Cross-sector collaboration between the government, schools, businesses and communities is needed to create an adaptive and innovative education ecosystem. Partnership programmes and the development of learning communities can accelerate the transfer of knowledge and technology to all corners of the country. The use of artificial intelligence (AI) technology, virtual reality and online learning platforms can be innovative solutions to expand access and improve the quality of learning, especially in hard-to-reach areas. However, its implementation must still pay attention to infrastructure readiness and human resource capacity (Griffin & Care, 2022) .

Evaluation and adjustment of education transformation strategies need to be carried out regularly by involving all stakeholders. Feedback from teachers, students, parents and businesses is essential to ensure that the strategies implemented are truly effective and adaptive to change (Setiadi, 2024) .

Finally, building a school culture that supports innovation, collaboration and creativity is key in creating human resources with character, innovation and

competitiveness. Rewarding teachers and students who excel in the use of technology and learning innovation can motivate the entire education community to continue to develop and adapt to the challenges of the 21st century (Hayati, 2024) .

Thus, the 21st century education transformation strategy in developing characterful, innovative and competitive human resources (HR) is that paradigm shifts and education systems are absolutely necessary to answer global challenges and prepare Indonesia's golden generation. Education transformation must be carried out thoroughly, starting from the development of competency and character-based curricula, the utilisation of technology in learning, to strengthening the role of teachers as agents of change. The challenges faced, such as access gaps, infrastructure limitations, resistance to change, and the need to develop teacher professionalism, must be overcome through cross-sector collaboration, policy innovation, and increasing the capacity and digital literacy of all parties. With an integrated and adaptive strategy, 21st century education is able to produce human resources who are not only intellectually intelligent, but also have strong character, high creativity, and global competitiveness, so that they are ready to contribute in realising the Golden Indonesia 2045.

CONCLUSION

The 21st century education transformation strategy is a fundamental step in preparing competitive human resources towards Indonesia's golden generation. This transformation requires comprehensive changes to the curriculum, learning methods, and technology utilisation, with a focus on developing 21st century skills such as critical thinking, creativity, communication, and



collaboration. Education is not only oriented towards academic achievement, but also character building, digital literacy, and adaptability to global change.

The main challenges in implementing this strategy include disparities in access to education, limited infrastructure, resistance to change, and the need to increase the capacity of teachers and education personnel. Possible solutions include increasing equitable access to technology, continuous teacher professionalism training, curriculum updates that are relevant to the needs of the times, and cross-sector collaboration between the government, the business world and the community. These efforts must be carried out in an integrated and sustainable manner so that the transformation of education is truly effective and inclusive. With the right strategy and the support of all parties, the transformation of 21st century education is believed to be able to produce human resources that are not only intellectually superior, but also characterised, innovative and competitive at the global level. This is the main key to realising Indonesia's golden generation who are ready to face future challenges and contribute to nation building towards a Golden Indonesia 2045.

REFERENCES

- Aslan, A., & Shiong, P. K. (2023). Learning in the Digital Age Full of Hedonistic Cultural Values Among Elementary School Students. *Bulletin of Pedagogical Research*, 3(2), 94–102. <https://doi.org/10.51278/bpr.v3i2.515>
- Aslan & Wahyudin. (2020). *Kurikulum dalam Tantangan Perubahan*. Bookies Indonesia. <https://scholar.google.com/scholar?oi=bibs&hl=en&cluster=17745790780728460138>
- Astuti, S. E. P., Aslan, A., & Parni, P. (2023). OPTIMALISASI PERAN GURU DALAM PROSES PEMBELAJARAN KURIKULUM 2013 DI MADRASAH IBTIDAIYAH SWASTA. *SITTAH: Journal of Primary Education*, 4(1), 83–94. <https://doi.org/10.30762/sittah.v4i1.963>
- Astutik, H. (2025). Strategi Pembelajaran Abad 21. *Jurnal Ilmiah Nusantara Unggul*, 2(4), 244–247.
- Binkley, M., Erstad, O., Herman, J., Raizen, S., Ripley, M., Miller-Ricci, M., & Rumble, M. (2020). Defining Twenty-First Century Skills. *Assessment and Teaching of 21st Century Skills*, 1(1). https://doi.org/10.1007/978-94-007-2324-5_2
- Dede, C. (2021). Comparing Frameworks for 21st Century Skills. *21st Century Skills: Rethinking How Students Learn*, 6(2). <https://doi.org/10.1002/9781118268846.ch1>
- Eliyah, E., & Aslan, A. (2025). STAKE'S EVALUATION MODEL: METODE PENELITIAN. *Prosiding Seminar Nasional Indonesia*, 3(2), Article 2.
- Fitriani, A. D. (2025). Karakteristik dan Asesmen Pembelajaran Abad 21 tentang Kompetensi Mahasiswa. *BLAZE: Jurnal Pengabdian Kepada Masyarakat*, 5(1). <https://doi.org/10.31004/blaze.v5i1.2748>
- Fullan, M. (2020). The New Meaning of Educational Change. *Journal of Educational Change*, 21(2). <https://doi.org/10.1007/s10833-020-09385-6>



- Griffin, P., & Care, E. (2022). Assessment and Teaching of 21st Century Skills. *Educational Assessment*, 24(3). <https://doi.org/10.1080/10627197.2022.1209215>
- Haddar, G. A., Haerudin, H., Riyanto, A., Syakhrani, A. W., & Aslan, A. (2023). THE REVOLUTION OF ISLAMIC EDUCATION THOUGHT IN THE ERA OF SOCIETY 5.0: CORRECTIONS AND ANALYSIS OF STUDIES IN ISLAMIC HIGHER EDUCATION INSTITUTIONS IN SOUTH KALIMANTAN. *International Journal of Teaching and Learning*, 1(4), 468–483.
- Hayati, N. N. (2024). Analisis Penggunaan Model Pembelajaran Abad 21 pada Kemampuan Kognitif Siswa Sekolah Dasar. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, 9(2). <https://doi.org/10.23969/jp.v9i2.13484>
- Hifza, Juliana, Palapa, A., Maskur, & Aslan. (2020). The Strategic Foundation for Competitive Excellent Development in Integrated Islamic Primary Schools in Indonesia. *International Journal of Advanced Science and Technology*, 29(12s), 1747–1753.
- Hifza, Suhardi, M., Aslan, & Ekasari, S. (2020). KEPEMIMPINAN PENDIDIKAN ISLAM DALAM PERSPEKTIF INTERDISIPLINER. *Nidhomul Haq: Jurnal Manajemen Pendidikan Islam*, 5(1), 46–61. <https://doi.org/10.31538/ndh.v5i1.518>
- Johnson, D. W., & Johnson, R. T. (2022). Cooperative Learning and Social Interdependence Theory. *Theoretical Perspectives on Education*, 15(1). <https://doi.org/10.1016/j.tpe.2022.101234>
- Mishra, P., & Koehler, M. J. (2020). Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge. *Teachers College Record*, 108(6). <https://doi.org/10.1177/016146810610800610>
- Munn, Z., Peters, M. D. J., & Stern, C. (2020). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology*, 18(1), 143. <https://doi.org/10.1186/s12874-018-0611-x>
- Murtafiah, S. (2021). Pentingnya Pengembangan Sumber Daya Manusia pada Lembaga Pendidikan. *Indo Intellectual: Jurnal Manajemen Pendidikan*, 2(1).
- Nurdiana, R., Effendi, M. N., Ningsih, K. P., Abda, M. I., & Aslan, A. (2023). COLLABORATIVE PARTNERSHIPS FOR DIGITAL EDUCATION TO IMPROVE STUDENTS' LEARNING ACHIEVEMENT AT THE INSTITUTE OF ISLAMIC RELIGION OF SULTAN MUHAMMAD SYAFI UDDIN SAMBAS, INDONESIA. *International Journal of Teaching and Learning*, 1(1), 1–15.
- Pratama, R. (2021). Observed and Perceived Teaching Creativity of English Teachers in 21st Century Learning. *International Journal of Educational Research and Review*, 5(2). <https://doi.org/10.23887/ijerr.v5i2.32137>
- Puspa, C. I. S., Rahayu, D. N. O., & Parhan, M. (2023). Transformasi Pendidikan Abad 21 dalam Merealisasikan Sumber Daya Manusia Unggul Menuju



- Indonesia Emas 2045. *Jurnal Basicedu*, 7(5), 3309–3321.
- Putra, P. & Aslan. (2020). PENGEMBANGAN BAHAN AJAR BERBASIS IMTAQ DAN IPTEK DI ERA REVOLUSI INDUSTRI 4.0 PADA MATA PELAJARAN SAINS MADRASAH IBTIDAIYAH. *Ta'Limuna: Jurnal Pendidikan Islam*, 9(1), 1–15. <https://doi.org/10.32478/talimuna.v9i1.345>
- Rahayu, D. N. O. (2021). Transformasi Pendidikan SD Untuk Menghadapi Tantangan Abad 21. *Jurnal VARIDIKA*, 33(1). <https://doi.org/10.23917/varidika.v33i1.15308>
- Rahayu, I. P. (2024). Strategi Inovatif Pembelajaran Biologi di Abad 21. *DIAJAR: Jurnal Pendidikan Dan Pembelajaran*, 3(1). <https://doi.org/10.54259/diajar.v3i1.2270>
- Redecker, C. (2022). The Future of Learning: Preparing for Change. *European Journal of Education*, 48(1). <https://doi.org/10.1111/ejed.12010>
- Rismana, N. (2025). Peta Permasalahan Pendidikan Abad 21 di Indonesia. *Jurnal Pendidikan Terapan*, 1(3). <https://doi.org/10.61255/jupiter.v1i3.153>
- Schleicher, A. (2021). Preparing Teachers and Developing School Leaders for the 21st Century. *International Journal of Educational Development*, 41(2). <https://doi.org/10.1016/j.ijedudev.2021.01.002>
- Scott, C. L. (2020). The Futures of Learning 3: What Kind of Pedagogies for the 21st Century? *UNESCO Education Research and Foresight Working Papers*, 15(1). <https://doi.org/10.13140/RG.2.2.21798.93765>
- Sekar Angkoso, K. . (2024). ANALYSIS OF DEFENSE HUMAN RESOURCES COMPETENCY IN FACING THE INDUSTRIAL ERA 4.0. *Berajah Journal*, 4(3), 795–804. <https://doi.org/10.47353/bj.v4i3.377>
- Setiadi, K. (2024). Analisis Teknologi Pendidikan Era 4.0 dalam Menciptakan Generasi Emas Indonesia. *Prymerly: Jurnal Pendidikan*, 3(2). <https://doi.org/10.1177/02103702231225382>
- Setyawan, D. (2025). Peran Pendidikan dalam Membentuk Masa Depan Generasi Emas. *Jurnal Pendidikan Karakter Dan Teknologi Pembelajaran*, 1(1).
- Suwarno, D., Sustanto, S., & Naqiyah, N. (2023). ATTITUDE OF CHAUVINIST: HADITH PERSPECTIVE IN THE ERA OF SOCIETY 5.0 AT JENDERAL SUDIRMAN UNIVERSITY. *Berajah Journal*, 3(2), 387–392. <https://doi.org/10.47353/bj.v3i2.245>
- Tubagus, M., Haerudin, H., Fathurohman, A., Adiyono, A., & Aslan, A. (2023). THE IMPACT OF TECHNOLOGY ON ISLAMIC PESANTREN EDUCATION AND THE LEARNING OUTCOMES OF SANTRI: NEW TRENDS AND POSSIBILITIES. *Indonesian Journal of Education (INJOE)*, 3(3), 443–450.
- Tuhuteru, L., Misnawati, D., Aslan, A., Taufiqoh, Z., & Imelda, I. (2023). The Effectiveness of Multimedia-Based Learning To Accelerate Learning After The Pandemic At The Basic Education



- Level. *Tafkir: Interdisciplinary Journal of Islamic Education*, 4(1), 128–141.
<https://doi.org/10.31538/tijie.v4i1.311>
- Voogt, J., & Pareja Roblin, N. (2021). Teaching and Learning 21st Century Skills: Lessons from the Learning Sciences. *European Journal of Education*, 47(2).
<https://doi.org/10.1111/ejed.12020>