

Challenges For Baby Boomers Generation Teachers In Implementing The Industrial Revolution 4.0 Curriculum

Rosida Kerin Meirani¹, Astri Nabila², Diah Ayu Prabandari³

^{1,2,3} Universitas Negeri Malang, Indonesia

Email: anandarose1@gmail.com, astri@gmail.com, diahayuu@gmail.com

*Correspondence: anandarose1@gmail.com

KEYWORDS

Industrial Revolution 4.0,
Curriculum, Teachers,
Baby Boomers.

ABSTRACT

The industrial revolution 4.0 is the technological era. In the world of education, technology is the key to success. Then the industrial revolution 4.0 curriculum emerged that included technology as its development. However, not all teachers are proficient in operating technology. The baby boomer generation is the generation that is considered the most difficult to adapt to technology because it was born in an era before technology so that the curriculum is a challenge. The purpose of this study is to find out the challenges of baby boomer teachers in implementing the 4.0 industrial revolution curriculum and their solutions. The research approach used is descriptive qualitative with literature study method. The challenges faced by these baby boomers are technology itself, motivation, and energy. Meanwhile, the solution to these challenges comes from the government, namely in the form of teacher certification and required competency training. From the school side, it is in the form of capacity building and providing motivation. And researchers also contribute solutions in the form of peer collaboration.

Attribution-ShareAlike 4.0 International (CC BY-SA 4.0)



Introduction

The industrial revolution 4.0 is often known as the digital revolution and the era of technological disruption. It is called the digital revolution because of the occurrence of computer profiling and automation of recording in all fields. Industry 4.0 is said to be an era of technological disruption because automation and connectivity in a field will make the movement of the industrial world and job competition non-linear. One of the unique characteristics of industry 4.0 is the application of artificial intelligence (Tjandrawinata, 2016). For example, the use of robots as an innovation in helping human labor so that it is cheaper, more effective and efficient. Although this is gradually used as a substitute for humans. Technological changes are changing everything automated almost on all sides. New technologies and approaches that combine the physical, digital, and biological worlds will fundamentally change the pattern of life and human interaction (Tjandrawinata, 2016). Irianto (2017) summarizes the challenges of industry 4.0,

including industrial readiness, trusted workforce, ease of socio-cultural arrangements, diversification and job creation and industry 4.0 opportunities, namely (1) ecosystem innovation, (2) competitive industrial base, (3) investment in technology and (4) integration of SMEs (Small and Medium Enterprises). The challenges and opportunities of industry 4.0 encourage various innovations and creations in the field of education to improve the quality of education to be able to compete. The government needs to review the suitability of existing education and work to respond to changes, challenges and opportunities in the industrial era 4.0.

The existence of changes, especially in technology, is one of the characteristics of the industrial revolution. In response to this, the quality of education also has an effect on preparing the next generation to face existing changes and teachers are required to master skills, adaptability to technology and global challenges (Lase, 2019). In this case, the educational institution should prepare for a new orientation and literacy in the field of education. Legacy literacy that relied on reading, writing and mathematics must be strengthened with data, technology, and human resources. Data literacy is the ability to read, analyze and use information from data in the digital world. Then technological literacy is the ability to understand mechanical and technological systems in the world of work. Meanwhile, human resource literacy is the ability to interact well, not rigid and have character (Herman, 2016). Facing the era of the industrial revolution 4.0, education is needed that can form a creative, innovative and competitive generation. This is a response to the needs of the industrial revolution 4.0 where humans and technology synergize to find innovations related to opportunities in several innovative and creative fields. According to Fisk in Lase (2017) there are nine things that are intensively discussed related to education 4.0, including the first to study at different times and places. Students in the implementation of learning are not tied to a certain time and space. The second is individual learning. Students will learn with learning equipment that is adaptive to their abilities. Third, students have a choice in determining how they learn. It is related to the way that students do to achieve their goals. Four, project-based learning, current students must already be able to adapt to project-based learning, as well as in terms of work. This shows that they are required to learn how to apply their skills to various situations. Five, field experience. Technological changes have effectively enabled the learning of certain domains, giving more room to acquire skills that involve student knowledge and face-to-face interaction. Six, interpretation of data. The development of computer technology has finally taken over tasks that are done manually, and immediately handles any statistical analysis, describing and analyzing data and predicting future trends. Seven, the assessment is mixed. Measuring students' abilities through conventional assessment techniques such as Q&A will become irrelevant. Eight, student engagement. This means that educational institutions in determining the learning materials and curriculum chosen weigh the quality of students. His opinion is taken into consideration in interpreting and influencing the curriculum. Nine, the change in education trends 4.0 above is the main responsibility of teachers to students. Teachers are expected to support this change and not consider it a threat to things that were previously

implemented, in the sense that teachers also accept changes that exist for the advancement of education.

In the era of the information technology industrial revolution, it is developing quite rapidly, therefore educators are required to be able to follow the flow of these developments. Educators are required to be able to convey knowledge through the use of information technology is not enough with old-school eruptions such as calistung etc. This problem requires educators to get input to improve their competence and professionalism in order to adjust themselves, especially in the era of the industrial revolution 4.0. In order to overcome this situation, steps are needed in the management of school institutions, namely by developing curricula that are applied in various schools.

The problem is related to change. Changes in the curriculum from period to period. According to M. Noor, there are two outlines that cause curriculum changes to occur frequently, namely comprehensive changes which make competition for performance requirements and also the second orientation of a paradigm shift in learning and teaching knowledge. In essence, changes in graduate competencies, changes in curriculum and changes in learning. For the success of education in the era of revolution 4.0, education is more sophisticated in the use of technological tools. Materials related to curriculum development policies are learning development, preparation of 21st century-based rpp, preparation of HOTS questions and assessment of learning outcomes. (M. Noor, <https://kalsel.kemenag.go.id/opini/677/Pengembangan-Kurikulum-MI-di-Era-Revolusi-Industri-40> accessed September 20, 2021).

According to Nielsen in Nuriana (2017) baby boomers are those born from 1947 to 1964 or who are now 54 to 74 years old. It was named a baby boomer because of the large birth rate like a bombshell after the end of World War II. This generation is known as a structured, loyal, hardworking figure but does not like to be criticized. This generation is also often described as a generation that believes in opportunity and is quite idealistic in making changes to their lives (Abrar, 2020). Teachers as education workers with age vulnerabilities in the baby boomers group are known to be unable to keep up with existing technological developments. The idealistic nature of baby boomers is one of the reasons they find it difficult to accept change. Teachers in this generation teach more by making up their lives to students so that the method that is often used in classroom learning is lectures. Teachers in this generation are also still teaching in a conventional way so they rarely use [technology in the learning process and they are more inclined to package books as teaching materials. In fact, to be able to survive we must be able to adapt and this is a challenge for teachers. Teachers who are not adaptive to technological developments and the globalization of information will find it difficult to learn in today's era, especially teachers teaching students who from a young age are close and accustomed to the technology around their environment.

Various principles and theories from each generation that exist, the main thing is that there are problems in technology-based education, Wolsey & Grisham (2011), which formulates into four principles that can be implemented for teachers in the teaching and learning process. (1) Promoting oneself as a facilitator, the role of teachers today is not

only as a bridge in obtaining knowledge but as a director and manager of knowledge that uses technology. (2) There is a collaboration of technological device capabilities that distinguish between digital natives and digital immigrants. There are still many teachers who instruct students to operate technology in the school environment, for example, projectors, this indirectly students become smarter without having to be exemplified first by educators. In this case, the teacher is able to teach students how to filter, analyze in internet / technology inventions. (3) Expansion of Reach. Many think that the internet and technology are the barriers of both students and educators, but in fact students can be helped by the existence of technology in obtaining information and becoming more effective and efficient. (4) Exploring information about technology, students are expected to be able to obtain information with technology with a wide reach and as much information as possible. Educators only bring learners into that technological environment between integrating technology and learning.

The implementation of learning in the era of the industrial revolution 4.0 is certainly a challenge for all parties involved in the world of education. Curriculum is the key to the running of a learning process at the unit level of education, so it becomes important to adapt the curriculum to the existing flow of development. The development of the industrial revolution that has reached level 4 has made the curriculum developed in accordance with it. The most significant adjustment to the curriculum in this era of the industrial revolution is the use of technology. In this era, learning that uses technology is quite dominantly applied to educational institutions at any level. This is a big challenge, especially for educators who are still stuttering with technology. The educators in this study were divided by generation consisting of baby boomer generation, generation x, generation y and generation z. Of these generations, the one that is considered the biggest challenge is from the baby boomer generation. This is because this generation was born even before technology was created so that it has a character that tends to be difficult to adapt to technology. Therefore, researchers consider it important to examine what are the challenges of baby boomers in implementing the curricula of the industrial revolution 4.0. What funds can be provided so that this generation can at least keep up with the rapid flow of change due to this industrial revolution.

Research Methods

The method used in this study is with a qualitative descriptive approach, which data collection techniques use literature studies. Literature studies are used to study the results of previous research both journals and in the form of books that match the problems that are meticulous in this study, (Ulfatin, 2015).

Results and Discussions

A. Teacher baby boomers

The Baby Boomers generation, that is, the generation born in 1946-1964, more precisely they were born after the second world war. Indirectly they are born, grow and develop with little influence of existing technologies. The technology of that time there

was only television, telephone, radio. Even technology is present when they are adults, in this case this generation is not very dependent on existing technology. Until finally this generation also rejected the existence of technology. However, for now education is dominated by the teaching and learning process with technology and the generation just sits and listens (Hani, 2019)

Based on data from the Ministry of Education and Culture regarding teacher statistics according to age, there are 58,400 teachers who belong to the baby boomer generation, where teachers and educators must adapt to technology, not only at the age of the baby boomer but in Indonesia there are still teachers and educators who belong to the age of the baby boomer.

B. Industrial revolution curriculum 4.0

In the era of the information technology industrial revolution, it is developing quite rapidly, therefore educators are required to be able to follow the flow of these developments. Educators are required to be able to convey knowledge through the use of information technology is not enough with old-school eruptions such as calistung etc. This problem requires educators to get input to improve their competence and professionalism in order to adjust themselves, especially in the era of the industrial revolution 4.0. In order to overcome this situation, steps are needed in the management of school institutions, namely by developing curricula that are applied in various schools.

Some of the curriculum options that must be developed according to M. Noor are as follows;

1. Future challenges, examples of the era of globalization with advances in information technology and creative industries
2. The emergence of negative phenomena, for example fights, corruption and even drugs
3. Future competencies, for example thinking ability, communication ability, moral ability
4. Community views or public perceptions, for example, focus on results instead of the process that goes through

Changes in the Curriculum from time to time According to M. Noor as follows; (1) The Planning Period (1947-1968) during which the Government prepared the planning of educators which initially became the Education needed nationally. (2) Development Period (1975-1994) Curriculum designed on achieving goals with a learning system that emphasizes the subject matter with disciplines. (3) Reform Period (2004-2006) the use of the KBK (Competency-Based Curriculum) and KTSP (Education Unit Level Curriculum) curriculum which achieves goals on the ability skills of students in the future. Curriculum 2013 or Kurtilas that prioritizes understanding, skills and character education in students. Learners are emphasized on understanding the material.

The problem is related to change. Changes in the curriculum from period to period. According to M.Noor, there are two outlines that cause quite a difference, namely between performance competition and the paradigm of learning knowledge which should be in harmony regarding changes in learning, changes in curriculum and graduate competencies. In order to succeed education in the era of revolution 4.0 where the era of

education with the use of advanced technology, the material used is related to curriculum changes, namely learning development by compiling 21st century rpp, compiling HOTS questions and ending with an assessment of learning outcomes.

Education in the Industrial Revolution Ea 4.0 is a phenomenon of need by adjusting the curriculum to current situations and conditions, for example utilizing the Internet of things (IOT). Students are facilitated with various curricula such as 3D printing, wearable (augmented reality and virtual reality), advance robotics. Artificial intelligent, internet of things (IOT). More precisely, this curriculum has a link and match between schools, the industrial world and the business world. (Peter, 2019)

The trend in Education 4.0 is the presence of teaching and learning activities with different times and places with the support of technology in online learning or better known as blended learning, including:

1. Flipped Classroom

Flipped Classrom is a learning model that is "flipping" in nature, namely the material given to students is done at home, each of these models is active learning

2. Integrate Social Media

There is an integration between social media into the classroom. Students can demonstrate mastery of existing technology with a variety of emerging content. This can be used by students in exchanging information with classmates, for example; WhatsApp.

3. Khan Academy

There is an integration of social media into the classroom. Students can show mastery of existing technology with a variety of emerging content. This can be used by learners in exchanging information with classmates, for example; whatsapp.

4. Project-Based Learning (PBL)

Khan Academy is a website where students can access it easily and for free it can make it easier for educators to give Exercises to each student.

5. Moodle

Moodle is a management design with Education that provides assignments, videos and exercises to students and students can discuss and interact with each other.

6. Scoology

Schoology is a social networking service that aims to manage, create a variety of content about academics.

C. Challenges of the baby boomer generation in implementing curriculum 4.0

Apart from the convenience presented by the industrial revolution 4.0, there are also challenges that must be faced by humans, especially in the problem of adaptation to technology. The generation that gets the most challenges is the baby boomers generation because they were born before technology was created. Fozahl explained that this happens because the baby boomers are not native to technology, so from the many types of technology it is difficult for this generation to accept. Fozahl continued that the problem of using this technology is also faced by baby boomers in the workplace (Fozahl, 2012). Currently, there are still many baby boomers who occupy an important structure in the world of data compiled by visual capitalists showing that the most dominant prospotion

of power is still in the baby boomers generation which is around 38.6%, while generation X is in second place with a percentage of 30.4% and the remaining percentage is controlled by generation Y and Z. This shows that the highest policymaking is still in the baby boomers. In the world of education, especially in Indonesia, as mentioned above, there are still around 58,400 GTK people who come from the baby boomers. In one of the schools in Tasikmalaya, there are still more than 15% of GTK who come from the baby boomers generation. Where 10 people come from the teacher group while the rest come from education staff.

Technology is a major issue for baby boomers, some of whom are more likely to be manual in doing their jobs. Widagdo quoted from Venkates as saying that baby boomers tend to refuse to accept new information technologies. This is reinforced by the manifestation that a person's perception of technology is influenced by his age where the older a person is, the lower his perception of technology (Widagdo, 2016). This is also the case in schools that have been mentioned above, the GTK, especially teachers, if given tasks that involve IT, they will more often delegate other younger teachers to carry out these tasks.

In addition to technology issues, there are also motivational issues. Where according to one of the teachers at the school, these baby boomers tend not to have high motivation in every task completion, this is because some of them are about to retire so they argue that it is not important for them to follow technological developments. In Indonesia alone in 2019 it was quoted from *kompas.com* that around 52,000 teachers will retire but not necessarily the government will be able to recruit that many teachers in the following year, namely 2020. This is proven by the data published on CNN Indonesia that throughout 2020-2024 the shortage of teachers predicted by the Ministry of Education and Culture will reach 1 million people. So that teachers who have even entered retirement age are still asked to serve until there is a replacement for the teacher. In one of the schools we used as a research reference, the retirement age remained at 60 years old, but some teachers who were at the age of 57-60 included low motivation in adjusting to the trend of learning in the era of revolution 4.0 because they felt that it was not necessary to do so considering that their period of service was no longer long enough.

The next issue or challenge is energy. It was said by informants that manpower was one of the challenges for baby boomers teachers. Implementing learning in this era curriculum requires teachers to be active, creative and solutive in terms of the learning process. Furthermore, education in this era in its implementation refers to the concept of industry 4.0, namely human connectivity, data, machines (Delipiter, 2019). So it requires more preparation in terms of preparation and also requires creative ideas from the teacher so that learning in the classroom becomes more interactive. This is certainly one of the challenges Because baby boomers in terms of doing work tend to prefer the manual way, in terms of learning, teachers in this generation tend to like methods such as lectures, and telling stories of the experiences they get. This is because their energy is no longer qualified to do energetic learning like the demands of the times.

D. Solutions to the challenges of the baby boomer generation in the implementation of curriculum 4.0

The challenges for baby boomers in implementing the industrial revolution 4.0 curriculum have prompted various parties to create solutions to these challenges. The government is no exception. In improving the competence of teachers, the government has provided alternative solutions such as the teacher certification program. This certification is a competency test in the form of a portfolio assessment, to assess the professionalism of teachers (Muslich, 2007). In addition, the government also conducts training. The training conducted by the government as conveyed by one of the parties in the school mentioned above is a special training for report.

Apart from the government, the school also provides its own alternative solution policies to improve the ability of teachers who are still considered less qualified in mastery such as capacity building. Capacity building is an activity held by the school with a series of fun events such as games that aim not only to strengthen member relationships but also to increase teacher competence in a fun way. As for vocational schools such as SMK, teachers are given the opportunity to intern in the industry, teachers are expected to be able to improve their competence by seeing direct practice in the field. In addition, motivation is given by the school to the baby boomers to keep the spirit of sharing knowledge even at an age that is almost retired.

Furthermore, by reviewing various literature, the researcher proposes a solution, namely peer collaboration. That is, collaboration between millennial teachers and baby boomers teachers. The existence of this collaboration can make it possible to produce comprehensive teaching materials where teachers from baby boomers who have considerable experience and knowledge will be supported by millennials who are creatively active and not stuttering technology. This is as stated by Murdianto, one of the lecturers in Indonesia, that indeed the millennial generation must move to help baby boomers by sharing knowledge even though it is slow but sure and also collaborating in a way that the older ones contribute material, the younger ones support with digital skills. As for the technical implementation, the selection of millennial teachers who are considered qualified in terms of technology is in accordance with the number of existing baby boomer teachers. Then the baby boomers teachers are allowed to choose their own millennial partners, this aims to reduce the awkwardness between the two generations of teachers, followed by the selection of time left to each pair with a predetermined duration. As an evaluation, attendance and progress reports must be made in this case the principal supervises the implementation so that attendance is reported and submitted directly to the principal.

Conclusion

The industrial revolution 4.0 causes all sectors in life to be inseparable from the world of technology. The baby boomers are a generation that is not familiar with technology from birth, so adapting to technology is a challenge that is quite difficult for

them. Plus, in the world of work, the use of technology is increasingly massive. In the world of education, almost all work is done with a combination of humans and technology which includes school administration activities and teaching and learning processes. The implementation of the industrial revolution 4.0 curriculum is a challenge for teachers from the baby boomers generation because in its implementation, this curriculum involves a lot of technology. The challenges faced by these baby boomers teachers are technology itself, motivation and energy. The solutions to these challenges come from the government in the form of teacher certification and competency training. From the school, it is in the form of capacity building and motivation. And researchers also contribute solutions in the form of peer collaboration.

References

- Abrar, W, A. 2020. Lierasi Media Sosial DI Kalangan Baby Boomers di Kota Padang. Universitas Airlangga: Fakultas Ilmu Sosial dan Politik
- Fisk, P. 2017. Education 4.0 the Future of Learning Will be Dramatically Different in School and Troughtout Life. <http://www.thegeniusworks.com/2017/01/future-education-young-everyone-taught-together/>
- Fisk, Peter. "Education 4.0 ... the Future of Learning Will Be Dramatically Different, in School and throughout Life." Last modified 2017. Accessed May 11, 2019. <http://www.thegeniusworks.com/2017/01/future-education-young-everyone-taughttogether/>.
- Fozahard., J.L and Wahl, H-W. 2007. Age and Cohor Effects in Gerontechnology a reconsideration. *Gerontotechnology* 11, pg 10-21
- Herman, M, dkk. 2016. Design Princiles for Industrie 4.0 Scenarios. In *Proceedings of the Annual Hawai International Conferences on System Science*.
<https://www.cnnindonesia.com/nasional/20201005180513-20-554645/kemendikbud-sekolah-kekurangan-1-juta-guru-hingga-2024> diakses pada 06 Desember 2021 pukul 5:00
<https://www.wartajogja.id/2021/08/kolaborasi-guru-generasi-baby-boomers.html> diakses pada 06 Desember 2021 pukul 5:41
- Irianto, D. 2017. Industry 4.0: The Challenges of Tomorrow. *Jurnal Revolusi Industri 4.0: Tantangan, Peluang dan Solusi Bagi Dunia Pendidikan*
- Kholifah, Siti Nur dan Wahyu Widagdo. 2016. *Keperawatan Keluarga dan Komunitas*. Jakarta Selatan: Kementrian Kesehatan Republik Indonesia
- Lase, 2019. Pendidikan ErA Revolusi Industri 4.0. *Jurnal Sundermann*
- M.Noor, <https://kalsel.kemenag.go.id/opini/677/Pengembangan-Kurikulum-MI-di-Era-Revolusi-Industri-40> di akses pada 20 September 2021
- M.Noor, <https://kalsel.kemenag.go.id/opini/677/Pengembangan-Kurikulum-MI-di-Era-Revolusi-Industri-40> di akses pada 20 September 2021
- Muslich, Masnur. (2007) *Sertifikasi Guru Menuju Profesionalime Pendidik*. Jakarta: Bumi Aksara
- Nuriana, D. 2019. Generasi baby Boomers (Lanjyt Usia) dalam Menghadapi Era Revolusi Industri 4.0. *Jurnal Pekerjaan Sosial*. Vol 2 No 1
- Peterlase. 2019. Pendidikan di Era Revolusi Industri 4.0. *Education 4.0, Industry 4.0, Blended learning, Teacher competence, 21st Century skills*.
- Tjandrawinata, R.R. 2016. *Industri 4.0: Revolusi Industri abad ini dan pengaruhnya pada*

bidang kesehatan dan bioteknologi. *Jurnal Medicinus*, vol 29, Nomor 1