Exploring The Engagement of Students with Artificial Intelligence Shock : A Case Study At Junior High School In Jakarta, Indonesia

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ABSTRACT

This study investigates the application of an e-learning platform that supports artificial intelligence and STEM technology, while clarifying the role of teachers, parental interest, and learning motivation in students' achievement in civic education in a junior high school in Jakarta, Indonesia. A proportional random selection was used to generate a sample of 50 students at SMP Jakarta. The research instrument used was in the form of a questionnaire, interviews, and observations. The results of this research show that students at SMP are able to adapt to the AI-based learning environment, and AI significantly improves students' learning motivation, especially in critical thinking and problem solving. The study concludes that integrating AI into the curriculum can increase student engagement and learning outcomes in collaboration with teachers and parental interest at home, emphasizing the need for AI training before academic endeavors in new contexts.

1. Introduction

A technological revolution in education has started with the emergence of the artificial intelligence era, and Education changes in accordance with the times giving moral education new life. Civic education is still in its infancy in Indonesia, but it is currently expanding quickly in many other nations[1][2].For instance, The "New Generation of Artificial Intelligence Development Plan," released by the State Council in July 2017, explicitly identifies intelligent education as a key task: "using intelligent technology to accelerate the reform of talent training mode and teaching methods and build a new education system that includes intelligent learning and interactive learning[3].However, improvements in technology have a Shock and come with hazards connected to essential, technical, and value aspects that make them less effective in civic education[4].

The phenomenon of AI shock is a common thing experienced by the per-university level- students in Indonesia, especially Jakarta city. Jakarta is an urban area that captures the strong Javanese culture. Teachers are also afraid that artificial intelligence, which is known as the "Fourth Industrial Revolution", will replace their work in the civic classroom Instead of helping to facilitate the educational process[5]. An e-learning platform that supports AI and STEM technology is regarded in this study is (https://www.iCivics.org/) in the classroom.

2. Background

Definition 2.1.

Artificial intelligence (AI) is, in general, a science that mimics the intelligence held by living organisms and applies it to machines in order to solve problems. Several professional viewpoints corroborate this understanding [6].

(1)John McCarthy (1960): Artificial Intelligence (AI) is the creation of machines that can think like humans and are designed to do so by modeling human cognitive processes.

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(2) Rolston (1988): Artificial intelligence (AI) is the application of computers to solve real- world issues, including human mental processes.

(3)Teahan (2010): Artificial Intelligence is the science of creating computer systems that exhibit multiple forms of intelligence.

John McCarthy, who is widely regarded as the father of artificial intelligence, first used the phrase artificial intelligence (AI) in 1955 when he and his associates prepared a proposal for the 1956 Dartmouth Summer Research Project on Artificial Intelligence [7] AI was defined as computers that "... use language, form abstractions and concepts, solve kinds of problems now reserved for humans, and improve themselves" in the proposal [8]. Since then, computer science's artificial intelligence field has grown. Throughout its history, computer scientists as well as experts from anthropology, biology, philosophy, psychology, and linguistics have contributed to and debated many aspects of artificial intelligence (AI), leading to a divergence in the field's studies and advancements [9]. Because numerous writers have presented multiple definitions of artificial intelligence, it is challenging to come up with a consensus on one. Creating intelligent machines is the general focus of AI research [10]. As stated in numerous other definitions [11], [12], [13] of artificial intelligence in this context refers to human intelligence. Creating intelligent machines is the general goal of AI research, and as indicated by numerous other definitions, intelligence in this context refers to human intelligence [7].

Defition2.2.

The term "artificial intelligence shock" refers to the Industrial 4.0 era, which used cloud computing, artificial intelligence, and the Internet of Things in a variety of human endeavors [14].[15].[16]. Furthermore, modern society has advanced into Society 5.0, where intelligent technology supports every aspect of human endeavor [17]. An industrial revolution known as the "AI Shock Revolution" is built on intelligent technology that can link digital, biological, and physical devices that are linked and able to communicate via online media. Academic difficulties equip graduates to use technologies that haven't been discovered yet, solve problems that haven't been identified yet, and enter the workforce that hasn't been developed yet [18]. The secret to dominating industry is education.4.0. Through improving and fairly distributing high-quality education, increasing access to it, and emphasizing the value of using technology to deliver a world-class education, Education 4.0 supports the realization of intelligent education and produces students with at least five 21st century skills: collaboration, communication, critical thinking, creativity, and caring. The 21st century offers multiple paradigms for education, including Information that is constantly accessible, machine calculation that is faster, automation that facilitates daily tasks, and communication that is always and everywhere available. However, a new paradigm known as STEAM—Science, Technology, Engineering, Art, and Mathematics—has emerged as a result of the industrial 4.0 age [20].The Education 4.0 paradigm states that: educational institutions must prepare students to meet the challenges of Industry 4.0 or the 21st century in order to produce output that can be ready for work; educational programs need to adopt technology and also the STEAM paradigm (Science, Technology, Engineering, Art, and Mathematics); education can make students intelligent but also have good character. The social life that students participate in can be fostered by schools.

Figure 1 illustrates the stages of change start from Industry 1.0 to Industry 4.0.

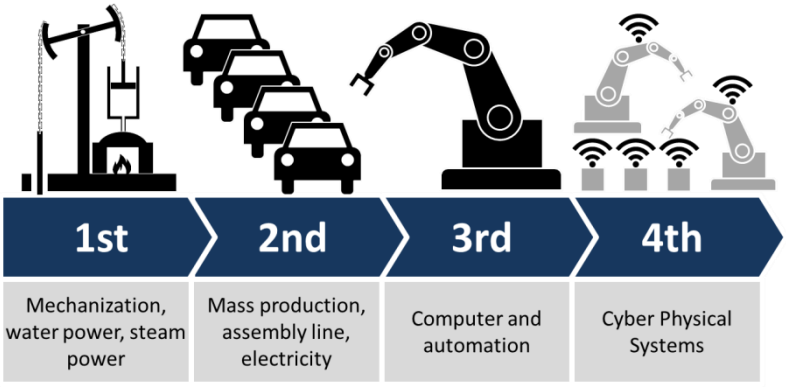


Figure 1 Development of Industria Technolog

(Source:https://id.wikipedia.org/wiki/Industri_4.0).

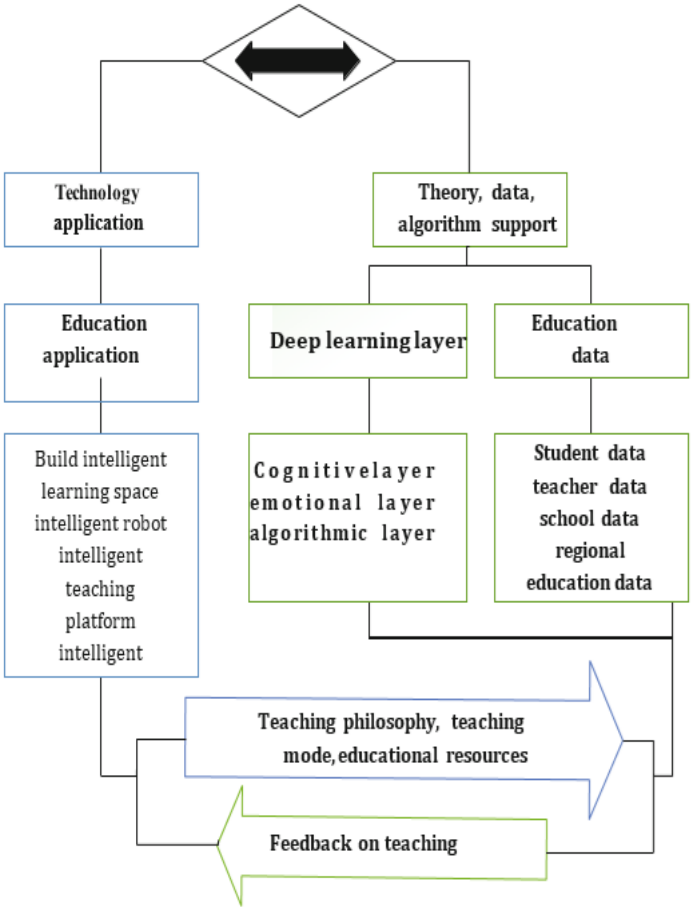


Figure 2: Educational AI technology

Civic education

Figure: Overall Module of intelligence paltform

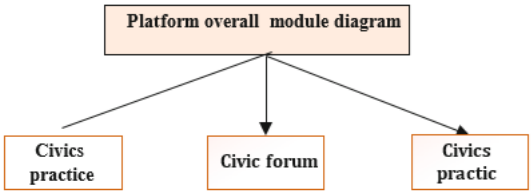


Figure: Overall Module of intelligence platform

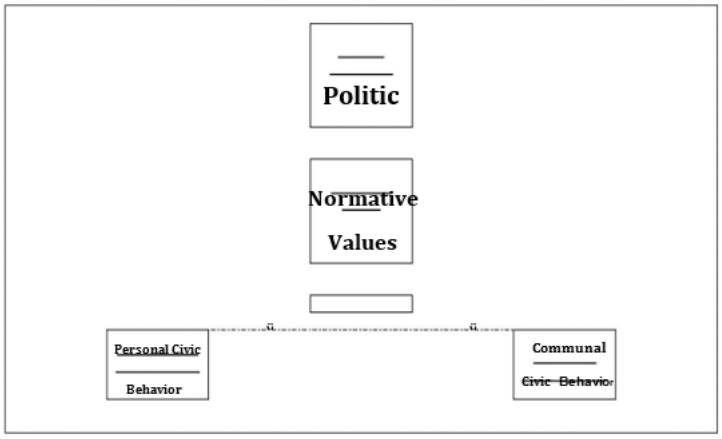


Chart1: Four Concepts of Civic Education

3. Methods

This study uses a descriptive qualitative research design, where data are collected through one-on-one interviews,in-depth observations and survey. The study participants were fifty students from SMP Jakarta who were randomly selected proportionally based on their willingness to participate in the study.Data collection was conducted over a period of months the results were analyzed thematically.

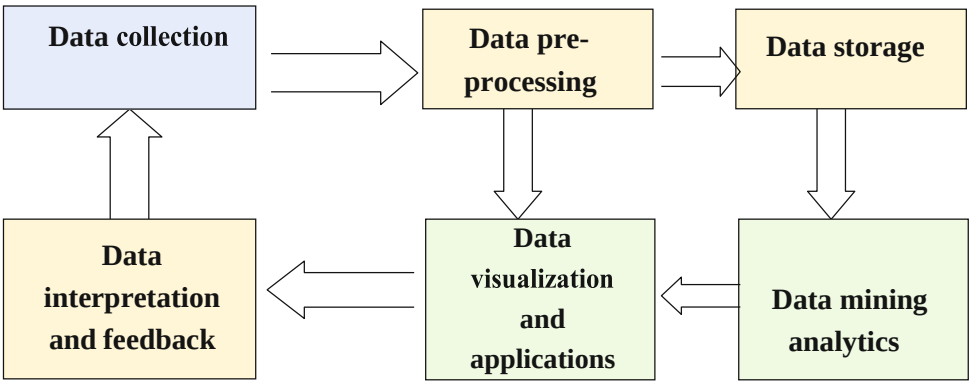
3.1. Data Collection Techniques: The interview techniques are used directly (face-to-face) and in-depth interview, according to the Interview Guide is a semi-structured interview guide.[21]. It's supported by a recording tool in the form of a "special recorder" to record the results of the interviews. A survey s using a distributed questionnaire. The questionnaire technique is used by answering on google drive form sheet. The respondents included boys and girls, with the majority in the age group of 13-15 years. The remaining respondents were older than 15 years. All participants were students enrolled in junior high school at SMP Jakarta, Indonesia.

The statuses of the pupils who continue to attend the junior high schools are collected in many photo documents that taken in order to gathering data and different records from archives and collections of local customary laws, Indonesia's Cybersquatting Law for the document.

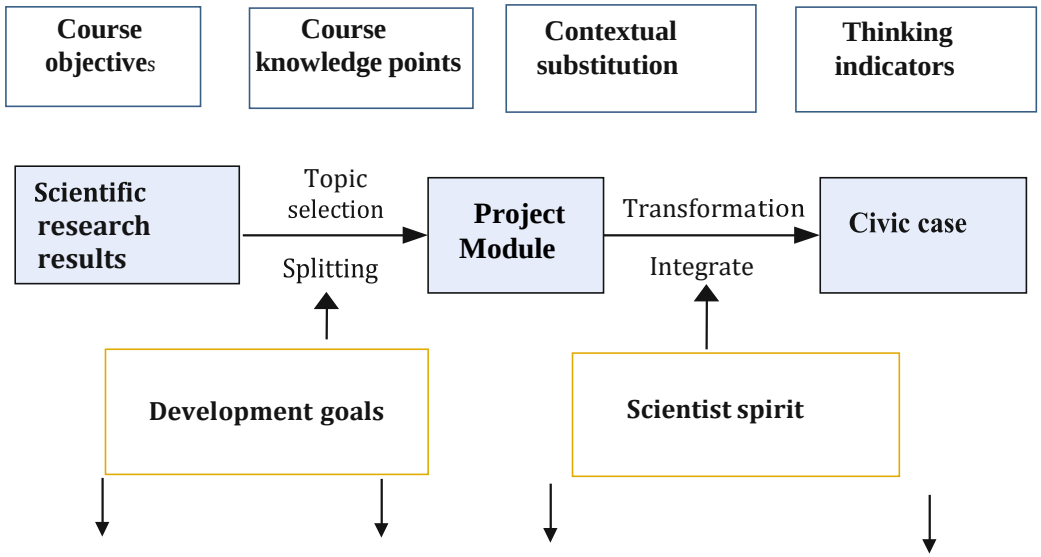
3.2. Data Collection Validity: Since this study is descriptive qualitative, the data collected will be qualitatively examined with the triangulation techniques are done in this paper to compare data collected using different ways with data inspected from the same source [22]. Because data can be considered legitimate if it is collected appropriately [23]and presented descriptively.

3.3.Data Analysis Techniques:

Figure 3: Flow chart of civic education big data platform application.



3.1. Data Analysis Validity: (Figure)



4. Result and Discussion

The degree of students' engagement and reactions to an iCivics website that supports artificial intelligence(AI) and STEM technology in the classrooms, were determined, as shown in Table 1 below:

Table(1) Student's engagement of iCivics website.

Engagement Frequency(%)				Mean	**Std.Dev.**
	AE	**PE**	**DE**		
D	0	0	3	4.73	0.452
A	27.3	24.2	24.2	4.76	0.435
SA	72.7	75.8	72.	4.70	0.529

D: Disagree.

A: Agree.

SA: Strongly Agree.

AE: Active Engagement.

PE: Passive Engagement

DE: Disengagement.

Std.Dev: Standard deviation value.

The terms actively engaged students, passive engaged students, and disengaged students were used to analyze the type of student engagement in the table above which shows the greatest increase in student engagement when using the educational website in the classroom. Also, all the questions have a high mean value greater than 4.0. When compared to other items, the four items have the largest standard deviation value (standard deviation = 0.609), indicating that the distribution of engagement scores is more dispersed than the mean score value.

The reason for the increased participation and interaction of students in addition to deep understanding is the teacher's assistance in the lesson and the parents' interest in two integrated directions, and because of maintaining the student's attention not being distracted inside the classroom and reviewing at home.

The interviews expanded the discussion to include questions about student needs regarding the additional role teachers should play as AI technology development. T9 shared, for instance, a new project my teacher is working on to figure out how to help me use websites with artificial intelligence as teaching materials. Put differently, the decision regarding the app's usefulness for their students and the manner in which they should utilize it falls on the shoulders of the teachers. Accordingly, T8's statement that "My subject teacher has a key role to play" in how to use AI services efficiently in the 1990s was an intriguing result from the interviews on the changing role of teachers. He declared, "I really want to pursue post-secondary education." I want to learn how to create learning applications in the future, not just use them." As a result, it is clear from the above that teacher participation in the creation of civic education tools can be crucial to their effective use and can be bolstered by empirical intelligence, as instructors can offer a variety of viewpoints on how to teach the various components of these tools.

T8: the eighth student.

T9: the ninth student

Applications with artificial intelligence are only tools made to improve student learning and teacher effectiveness. Additionally, despite the fact that AI is altering many facets of education and self-learning, these developments shouldn't be seen negatively, according to the interviews. Rather, educators and school administrators need to understand the new roles that AI-integrated learning environments require of them and be ready to adjust accordingly [24]. On the other hand, , whose educators has talents in both development and adaptability, highlights that the most crucial phase of AI is the learning- giving phase. But on the other hand, some students, such as T13 and T12, told us that their parents noticed that T13 and T12, after using this technology, became more disciplined in studying, and now they pay more and better attention during the academic subject, which made them study more seriously and desire to achieve higher grades. Students T5, T10, and T4 added: The parents of each of them were punishing them because of their low grades. This puts pressure on them. Equally, some people are sounding the alarm about various aspects due to the huge trend that the country is witnessing towards artificial intelligence. They believe that these classrooms are laboratories for future generations. While these iron tools may help their children raise their grades, it is not yet clear how to achieve this until they become adult citizens, as is the case with parents of T1, T2, T3, T17, and others. Parents have an important role in forming an adolescent's personality at home before introducing them to new experiences at school, as their educational backgrounds are frequently the first informal institutions that children are exposed to before transitioning to official education institutions in schools [25].

T1: the fist student**.**

T2: the second student.

T3: the third student.

T4: the fourth student.

T5:the fifth student**.**

T10:the tenth student.

T12:the twentieth student.

T13:the threaten student.

T17:the seventh student.

4.1.LEARNING MOTIVATION

After examining the results, it can be said that teaching civic education to students using the EAI-based methodologies enhances their learning processes. Children that are keen to study about Pancasila and civics show a desire to do so using the AIS approach. Students also discuss the importance of civic education and Pancasila in their lives.The study also discusses the necessity of using technology—more especially, artificial intelligence in order to create educational activities that would hold students' attention. The methods that AI can affect student performance and learning environments are listed below.

EAI: Educational Artificial Intelligence.

For example, T18expressed interest in using AI website, saying that returning home would help him learn more. “The less you repeat in order to memorize the script, the happier you will be,” he insisted. In fact, T19 didn't seem too concerned about using the AI-powered learning method. Since my English is only at an intermediate or intermediate level, I have to admit that I feel a little nervous. But like my colleagues, I have to accept change and move forward. He knew that despite his fears, he had to expose them to technological advances. Accordingly, despite T20's expression of his teachers' concerns, T34 emphasized that in order for him to learn from technology effectively and quickly, his parents and school must provide guidance for its correct use. This message cannot be overstated.

Participants were also introduced to the idea of the possibility of replacing parents and teachers at home with educational centers based on artificial intelligence. All agreed that parents and teachers will continue to need guidance and supervision; Artificial intelligence will not replace them. T44, for example, said, “My teacher has to help me, and in my opinion my teacher is still an important person.” T45 added: “Now I think my school still needs teachers in the classroom.” Websites with educational AI are just tools, and I still need the support of my family and teachers because the primary responsibility of a teacher is to facilitate students' learning. This is the job that AI can help my teachers do.

AI: Artificial Intelligence.

T19: the nineteenth student.

T20: the twentieth student.

T34: the thirty fourth student.

T44: the forty fourth student.

T45: the forty fifth student.

5. Conclusion

We conclude from this research study that upgrading the engagement of the junior high school pupils by using EAI in civic classrooms that work to improve critical thinking and responsibility of the students in AI-era when the highest value of the learning upgrade was obtained in caring parent and trained teachers (By %).

Reference

[1] Dewantara, J. A., Suhendar, I. F., Rosyid, R., & Atmaja, T. S. (2019). Pancasila as ideology and characteristics civic education in Indonesia. International Journal for Educational and Vocational Studies, 1(5), 400-405.

[2] Campbell, D. E. (2019). What social scientists have learned about civic education: A review of the literature? Peabody Journal of Education, 94(1), 32-47.
[3] Waluyandi, F., Trihastuti, R., & Muchtarom, M. (2020). Implementation of parental involvement in learning civic education. Budapest International Research and Critics in Linguistics and Education (BirLE) Journal, 3(4), 1686-1695
[4] Aziz, S., & Dowling, M. (2019). Machine learning and AI for risk.management. Disrupting finance: FinTech and strategy in the 21st century, 33-50.
[5] Selwyn, Neil. "What's the problem with learning analytics?." Journal of Learning Analytics 6, no. 3 (2019): 11-19.
[6] Hastungkara, D. P., & Triastuti, E. (2019). Application of e-learning and artificial intelligence in education systems in Indonesia. ANGLO-SAXON: Journal of the English Language Education Study Program, 10(2), 117-133.
[7] Sumakul, D. T. Y., Hamied, F. A., & Sukyadi, D. (2022). Artificial intelligence in EFL classrooms: Friend or foe. LEARN Journal: Language Education and Acquisition Research Network, 15(1), 232-256.
[8] McCarthy, J. (1960). Recursive functions of symbolic expressions and their computation by machine, part I. Communications of the ACM, 3(4), 184-195.
[9] McCarthy, J., Minsky, M. L., Rochester, N., & Shannon, C. E. (2006). A proposal for the dartmouth summer research project on artificial intelligence, august 31, 1955. AI magazine, 27(4), 12-12.
[10] Luckin, R., & Holmes, W. (2016). Intelligence unleashed: An argument for AI in education.
[11] Nilsson, N. J. (2011). The Quest for Artificial Intelligence: A history of Ideas and Achievements, The Quest for Artificial Intelligence: A History of Ideas and Achievements.
[12] Kusumadewi, S. (2003). Artificial Intelligence (Teknik dan Aplikasinya), Yogyakarta. Graha Ilmu.
[13] Rich, E. (1983). Artificial intelligence.
[14] Stone, P., Brooks, R., Brynjolfsson, E., Calo, R., Etzioni, O., Hager, G.& Teller, A. (2016).One hundred year study on artificial intelligence.
[15] Muhammad Nizam, 2018; Office of Chief Economist Bank Mandiri, 2018.Muhammad Nizam, S. (2018). Revolusi industri 4.0: Suatu Pengenalan. Seranta FELDA Jabatan.
[16] Sadiyoko, A. (2017). Industry 4.0: Ancaman, tantangan atau kesempatan? Sebuah introspeksi menyambut kemajuan teknologi saat ini.
[17] Suwardana, H. (2018). Revolusi industri 4. 0 berbasis revolusi mental. JATI UNIK: Jurnal Ilmiah Teknik Dan Manajemen Industri, 1(2), 109-118.
[18] Anggraheni, R., & Astuti, R. D. (2020). Revitalisasi nilai-nilai islami dalam edukasi guna mempersiapkan generasi menuju era Society 5.0 sebagai bagian dari strategi rekonstruksi kejayaan peradaban Islam. Prosiding Konferensi Integrasi Interkoneksi Islam Dan Sains, 2, 31-34.
[19] Pangestu, K., & Nuraini, N. L. S. (2020). Kesiapan Calon Guru Sekolah Dasar Dalam Menghadapi Era Revolusi Industri. ELEMENTARY SCHOOL JOURNAL PGSD FIP UNIMED, 10(2), 40-47.
[20] Thompson, C. J., Barber, K., & Bourget, E. M. (2018). STEAM (Science, Technology, Engineering, Art, and Mathematics) Education and Teachers' Pedagogical Discontentment Levels. PEOPLE: International Journal of Social Sciences, 4(3), 496-518.
[21] Moleong, l. (2014). Metodelogi penelitian kualitatif. Pt. Remaja rosdakarya. Journal of materials processing technology, 1(1), 1–8.
[22] Sugianto, R., Darmayanti, R., & Humaidi, M. N. (2022). MUHAMMADIYAH EDUCATION'S READINESS IN THE SOCIETY 5.0 ERA. Al'Adalah, 25(1), 21-34.
[23] Sugiyono. (2021). Metode Penelitian Kuantitatif, Kualitatif, dan R&D (2nd ed.). ALFABETA,cv. System, 38 (2010) 560-568.
[24] Sharifuddin, N. S., & Hashim, H. (2024). Benefits and Challenges in Implementing Artificial Intelligence in Education (AIED) in ESL Classroom: A Systematic Review (2019-2022). International Journal of Academic Research in Business and Social Sciences, 14(1), 146-164.
[25] Dini, E. S., Wardi, Y., & Sentosa, S. U. (2019, April). The Influence of Parent's Attention, Parents Education Background, Learning Facilities and Learning Motivation toward Student Learning Achievement. In 2nd Padang International Conference on Education, Economics, Business and Accounting (PICEEBA-2 2018) (pp. 819-827).