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AIEd in Elementary School Nationalism Education: A Systematic Literature Review

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Abstract. This paper presents a systematic literature review (SLR) on artificial intelligence in education (AIEd) in elementary school nationalism education based on Scopus literature 2020-2024. This research, using the SLR method and PRISMA protocol, was carried out by means of an article search process through the stages of identification, filtering, eligibility, inclusion, and presentation of analysis with the Scopus database via Publish or Perish 7, VOSviewer and ATLAS.ti. The research findings indicate AIEd integrates AI and artificial technology, Google, Facebook, smartphones, and IoT with education, curriculum, learning, student skills, and assessment for improving nationalism learning in elementary schools. AIEd features have evolved from traditional AI technologies to more advanced ones: intelligent tutors, tutees, learning tools, and policy-making advisors. The AIEd programs include chatbots, ChatGPT, ChatGPT-3, ChatGPT-4, Microsoft Copilot, AI-Writer, Bard, Bing Chat, Botsify, Chat PDF, Claude, Consensus, Copy.ai, Duolingo, Ebbot by Learnify, Elicit, Ernie, Essay Writer, Jasper AI, Jenni AI, Laser AI, Lateral AI, Ludwig, PaperPal, Plaito, Querium, and Quillbot. Further programs include Research Rabbit, Scholarcy, SciSpace, Wisio, Wordtune, Writely AI, ALEKS, Deakin University's Genie, Pounce Chatbot, machine learning (ML), and deep learning (DL). In addition, there are also programs such as neural networks, quantum computing, Google's Teachable Machine, Machine Learning for Kids, Pop Bots, Scratch, Python, Khan Academy, Duolingo, Generative AI, and LLMs. The application of AIEd in elementary nationalism education implies the integration of technological pedagogical content knowledge TPACK, DL, predictive analysis, ML, neural networks, expert systems, and social robotics in fostering democratic and civic awareness with a combination of movies, puppets, comics, nationalism characters, integrity, and textbooks.

Keywords: AIEd, nationalism; nationalism education; elementary school; systematic literature review

1. Introduction

AIEd or AIED in education and learning has been researched by scholars worldwide in 2020-2024 (Díaz & Nussbaum, 2024; Galindo-Domínguez et al., 2024; Lee et al., 2024). This includes a review of AI in education (Lijia et al., 2020), a systematic literature mapping study on AI-enabled adaptive learning systems (Kabudi et al., 2021), a systematic review of 2011-2022 research on AI in higher education (Ouyang et al., 2022), a systematic literature review (SLR) on digital learning management with ChatGPT (Faruq et al., 2023), and a SLR study on the challenges and opportunities of learning with AI on campus (Renato et al., 2023). Also included are a systematic review on the use of ChatGPT in education, research, and healthcare (Sallam, 2023), a bibliometric study on the assessment of AI progress and drone integration in agriculture (Slimani et al., 2024), a systemic analysis of AI in ML in the banking sector (Jáuregui-Velarde et al., 2024), robot therapy with AI for children with disabilities with scoping review (Yahya et al., 2024), and a bibliometric study on AI progress in medicine (Andrade-Arenas & Yactayo-Arias, 2024). Further research studies comprise a SLR study on ChatGPT for character education and learning process (Mahsun et al., 2024), and SLR on challenges and benefits of AIEd in ESL classroom (Sharifuddin & Hashim, 2024). Despite these research studies, no SLR study has focused on AIEd in nationalism education in elementary schools. Many scholars conduct research trends on AIEd worldwide, with various authors, collaborations, topics, changes, and futures (Chen et al., 2022). Nevertheless, AIEd research that focuses on nationalism education in elementary schools is still minimal.

Nationalism character education is an essential element in the education curriculum. National character education aims to instil a love for one's country, national pride, and responsibility as citizens from an early age (Ramadhani et al., 2023; Zubaidah & Dari, 2023). Elementary school institutions have a strategic role in shaping the character of the nation's children. However, practical and exciting approaches, strategies, methods, and learning media in conveying nationalist values are often challenging for educators, especially in the current era of digital technology development and AI (Maisyaroh et al., 2023). Nevertheless, technological developments, including AI, open new opportunities in the world of education. One AI application that is increasing is ChatGPT, an AI-based language model that can interact and respond like humans (Zhang & Shao, 2024). ChatGPT is a student chatbot assistant that has the potential to be used in various educational contexts, including in learning nationalism character education in elementary schools (Yu et al., 2023).

Conceptually, AIEd is a technological and application-based learning approach designed to enhance learning and teaching experiences such as virtual tutors and assistants, personalized learning, virtual reality (VR) and augmented reality (AR), project-based learning, and automated assessment (Yang, 2022). Integrating AI into education aims to make learning more efficient, effective, and engaging for students. AIEd includes functions to enhance adaptive learning, visual tutors, integration into the curriculum, digital-based evaluation and assessment, personalized learning, educational chatbots, and the use of learning media by utilizing AIEd (Holmes, 2024; Uden & Ching, 2024). AIEd includes various types,

such as ChatGPT, which both positively and negatively impact education and learning (Lo, 2023). Nevertheless, AI determines a sustainable future primarily through education and learning (Goralski & Tan, 2020). The character of nationalism in elementary school referred to in this study is a character that leads to love for one's country, respect for the symbols of the country, respect for diversity, pride in the nation, cooperation and togetherness, discipline, responsibility, respect for the services of the founders and fighters of the nation, willingness to sacrifice and be active in social activities, and being active in national activities (Kurniawan et al., 2024; Wahyani et al., 2022).

The current literature shows how necessary it is to study AIEd in elementary school nationalism education because the development of the current era leads to AI, which in turn could result in technological disruption and erosion of national character. Therefore, nationalism must be strengthened from elementary school level (Jalal, 2024; Nuraisyah, 2024). Nationalism education is urgent because it is a fortress for educators to strengthen students' positive character (Nandzah, 2024). The SLR study of research on AIEd in the context of nationalism education in elementary schools has raised several significant topics of interest. AIEd studies in nationalism education provide a foundation for the practical application of technology in educating the younger generation on the importance of nationalism. This improves the quality of learning and builds a strong foundation for the development of national character and identity in primary school children.

This article aims to present a SLR on AIEd in nationalism education in primary schools. This research explores the concept of AIEd in primary school nationalism education, the features and kinds of AIEd, and the application of AIEd in nationalism education in primary schools using the SLR method. The results of this study are expected to produce concepts, features, types, and applications of AIEd in elementary school nationalism education. Researchers posed the central question: How is AIEd utilised in nationalism education in elementary schools? The specific questions are as follows:

1. How are the validity and reliability of the AIEd concept measured in the reviewed articles?
2. To what extent are the features and types of AIEd consistent across studies?
3. Does the application of AIEd in the context of elementary school nationalism education show validity in primary education?

2. Methodology

2.1 Research Design

This research employs a qualitative approach, technically utilizing the SLR method. The SLR is applied to establish, identify, and evaluate studies under review in a structured manner, aiming to address the research questions (Syamsul et al., 2023). The SLR flow here refers to the preferred reporting items for systematic reviews and meta-analysis (PRISMA) technique, which identifies AIEd topics in elementary school nationalism education in the current literature from the Scopus database (Ware et al., 2024). The stages of identifying AIEd topics in primary school nationalism education are described in recent articles in the

Scopus database, along with the stages of identification, screening, eligibility, and inclusion (Pedraza-Ramirez et al., 2020).

2.2 Inclusion and Exclusion Criteria for Selection of Publications

In this stage, nine criteria are determined. First, articles were published in scientific journals in 2020-2024 because in terms of coverage, in this period the trend of AI publications in education started to develop. Scopus was chosen because it is the largest and most trusted database for scientific literature. It offers comprehensive metadata, broad and interdisciplinary coverage, and can be accessed through the Publish or Perish 7 application. Secondly, articles were sought through the Publish or Perish 8 application. Thirdly, articles were limited to publications in peer-reviewed scientific journals. Manuscript findings in books, papers, theses, dissertations, and conference articles were not considered. Fourthly, articles were searched for based on the suitability of the research theme and topic, namely AIEd in elementary school nationalism education. Fifthly, articles were limited to English. Next, the articles used were from international journals. In addition, the articles reviewed were full PDFs. Finally, the articles reviewed were those published with open access status while those with closed access were excluded. These nine criteria were the basis for researchers to either include or exclude quality literature.

2.3 Screening and Eligibility Assessment for Data Analysis

This stage was carried out by searching for articles from Scopus-indexed journals through the Publish or Perish 8 application on September 24, 2024. Screening on title, abstract, and keywords (tit-abs-key) was specific to the theme of AIEd in elementary school nationalism education. The process of inclusion and exclusion of articles was carried out from the article findings. The search findings obtained 1,310 articles from Scopus, as detailed in Table 1.

Table 1: Article Findings for 2020-2024 through Publish or Perish 7

Numb.	Keyword	Quantity
1	AIEd	200 articles
2	Digital Learning in Mathematics	200 articles
3	AIED in Elementary School	1 article
4	Artificial Intelligence in Education 200	200 articles
5	Artificial Intelligence in Elementary School	168 articles
6	Artificial Intelligence in Education in Nationalism Education	1 article
7	Nationalism Education	200 articles
8	AI in Elementary School	135 articles
9	AIEd Features	35 articles
10	Types of AIEd	28 articles
11	ChatGPT in Elementary School	16 articles
12	Application of AIEd	102 articles
13	Systematic Literature Review in AIEd	24 articles
Quantity		1,310 articles

The 1,310 articles found were screened for relevance to the theme of this research. Only relevant literature was used, with irrelevant literature being discarded according to tit-abs-key. A total of 50 selected articles were entered in the Mendeley Desktop application version 1.19.8 and saved in RIS format. The RIS format file was entered into the VOSviewer application version 1.6.20 to map the initial relevance network to the theme studied. To strengthen the argument of relevant research, an initial analysis of thematic associations in the literature used in this study is required through the VOSviewer application version 1.6.20. The preliminary analysis of thematic associations in Figure 1 shows that AIEd in primary nationalism education confirms that the pattern of associations is very complex.

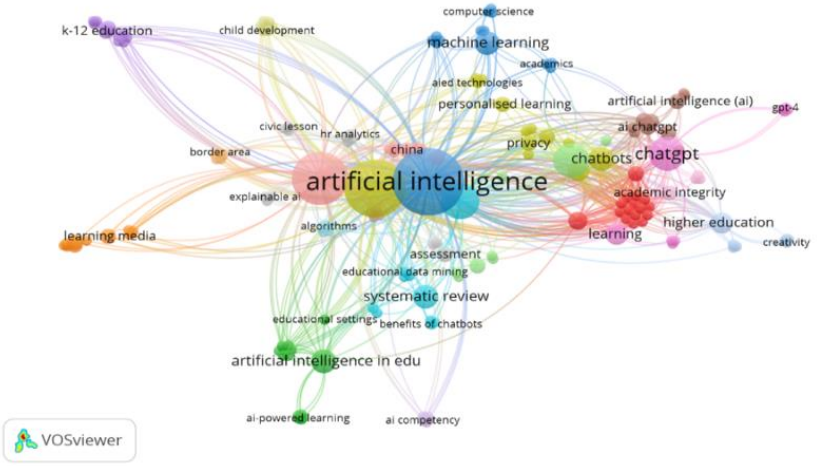

Figure 1: Initial Network Visualization

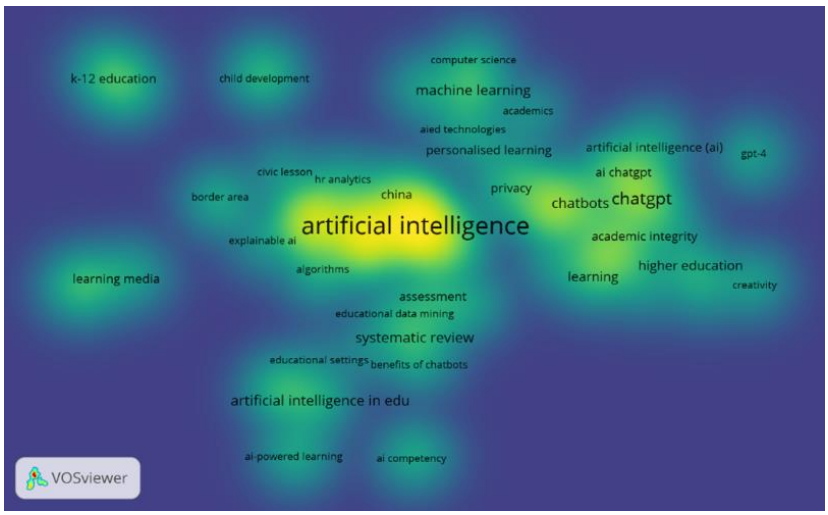

Figure 2: Initial Density Visualization

Figures 1 and 2 show that discussions and studies related to AIEd in elementary nationalism education are very close to several other study themes based on the number of keywords that appear calculated from the VOSviewer application version 1.6.20. These include AI (39 pieces), AIEd (29 pieces), elementary school

(24 pieces), ai (11 pieces), education (10 pieces), ChatGPT (10 pieces), chatbots (4 pieces), ethics (4 pieces), and learning (4 pieces). Meanwhile, there were other aspects unrelated to the AIEd study themes with fewer than three keywords, such as K12 education, child development, learning media, border area, civic lesson, AI competency, AI-powered learning, computer science, ML, GPT-4, digital era, academics, and others.

2.4 PRISMA Flow Diagram

The PRISMA technique is used in Scopus-indexed literature searches through identification, screening, eligibility, and included steps. Each step determines the results of quality articles using the application chosen by the researcher. Each stage is carried out using the Publish or Perish 8 application, Mendeley Desktop version 1.19.8, and ATLAS.ti version 7.5.16. The search stages with the PRISMA flowchart are described in Figure 3 below:

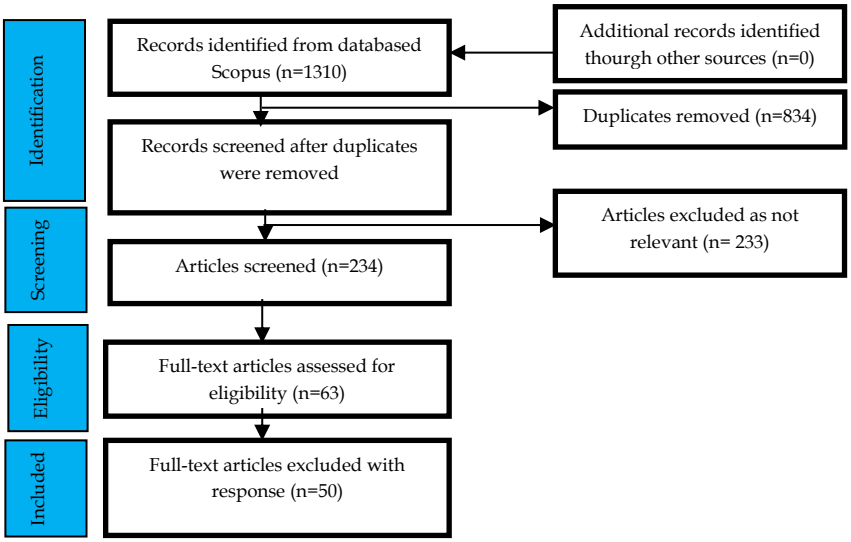

Figure 3. PRISMA Flow Diagram for Systematic Review (Ibda et al., 2023)

From the PRISMA image, the identification stage found 1,310 kinds of literature with the Publish or Perish 8 application (Table 1). At the screening stage, 834 articles were found to be the same, and 467 remained. From the screening stage, 234 articles were selected, and 233 sources of irrelevant literature were discarded. At the eligibility stage, 63 full-text articles were selected for reading and analysis, while 171 articles were not used. At inclusion, 50 articles were selected concerning the research question in terms of tit-abs-key and the substance of the literature. The next step was to enter the 50 full PDF articles into the ATLAS.ti version 7.5.16 application to be analyzed, mapped and the results presened with reference to the three research questions. ATLAS.ti was chosen to generate more contextual findings and categorizations on AIEd in primary nationalism education.

2.5 Result and Discussion

The findings of the 50 articles are presented first before presenting the discussion according to the three research questions. In Table 2, 50 articles are presented with the journals' criteria (journal name, volume, edition, and year of publication) and their citations, country of research, methodology, and research questions (RQ),

namely RQ 3.1; the concept of AIEd in elementary school nationalism education, namely RQ 3.2 and features and types of AIEd, namely RQ 3.3. The application of AIEd in elementary school nationalism education is shown in Table 2 below:

Table 2: 50 Artıcles from the Scopus Database

No	Journals	Countries	Method	RQ
1	Indonesian Journal of Electrical Engineering and Computer Science, Vol. 18, No. 1, April 2020 (Berhil et al., 2020)	Morocco	Review paper	3.1
2	Computers and Education: Artificial Intelligence Volume 1, 2020 (Xieling et al., 2020)	Several countries	Systematic review	3.2
3	Learning, Media and Technology Volume 45, 3, 2020 (Knox, 2020)	China	Policy analysis	3.3
4	Educational Philosophy and Theory 2020 (Cope et al., 2020)	USA	Experimental	3.2
5	London Review of Education 18, 2, 2020 (Gray, 2020)	UK	Explorative	3.3
6	International Journal of Innovation Studies 4, 2020 (Guan et al., 2020)	Several countries	Literature review (web-scraping)	3.1
7	Frontiers in Psychology 11, 2020 (Luan et al., 2020)	Taiwan	Explorative	3.2
8	Universal Journal of Educational Research 8 (8) 2020 (Hidayat et al., 2020)	Indonesia	Comparative (quasi-experimental approach)	3.3
9	International Journal of Educational Methodology Vol. 6, 2, 2020 (Murti et al., 2020)	Indonesia	Needs analysis	3.3
10	International Journal of Scientific and Technology Research, 9, 3, 2020 (Prasetiyo et al., 2020)	Indonesia	Qualitative descriptive	3.3
11	The TQM Journal, Vol. 32 No. 4 2020 (Dhamija & Bag, 2020)	Several countries	Review and bibliometric analysis	3.1
12	Business Horizons, Volume 63, 1, 2020 (Kaplan & Haenlein, 2020)	Germany and France	Qualitative descriptive	3.2
13	Sustainability, Volume 12, 14, 2020 (Chiu & Chai, 2020)	China	Qualitative study	3.3
14	Ilkogretim Online - Elementary Education Online, 19, 3, 2020 (Muhtarom, 2020)	Indonesia and Malaysia	Content analysis method	3.3
15	Computers and Education: Artificial Intelligence, 1, 2020 (Hwang et al., 2020)	Several countries	Literature review	3.2
16	Hindawi: Complexity, 2021 (Xuesong et al., 2021)	Several countries	Systematic literature review/Content analysis	3.1
17	Computers and Education: Artificial Intelligence 2 (2021) (Ouyang & Jiao, 2021)	Several countries	Systematic literature review	3.2
18	Indonesian Journal of Electrical Engineering and Computer Science,	Iraq	Review research	3.2

	Vol. 24, No. 1, October 2021 (Hassan et al., 2021)			
19	Computers and Education: Artificial Intelligence 2 (2021) (Okonkwo & Ade-Ibijola, 2021)	Several countries	Review of literature	3.2
20	Journal of Legal, Ethical and Regulatory Issues, 23, 5, 2021 (Trisiana, 2021)	Indonesia	Qualitative research	3.3
21	Computers and Education: Artificial Intelligence 3 2022 (Su & Yang, 2022)	Several countries	Scoping review	3.1
22	The Electronic Journal of e-Learning, 20 (5) 2022 (Tapalova & Zhiyenbayeva, 2022)	Kazakhstan and Russia	Investigative research	3.1
23	Computers and Education: Artificial Intelligence 3, 2022 (Khosravi et al., 2022)	Australia	Case study	3.2
24	Computers and Education: Artificial Intelligence 3, 2022 (Bhutoria, 2022)	USA, China, and India	A systematic review	3.1
25	Discover Artificial Intelligence 2, 4, 2022 (Jiang et al., 2022)	Several countries	Review	3.1
26	International Journal of Evaluation and Research in Education (IJERE) Vol. 11, No. 1, 2022 (Basri et al., 2022)	Indonesia	Correlational research	3.3
27	International Journal of Evaluation and Research in Education (IJERE) Vol. 11, No. 3, 2022 (Suarno et al., 2022)	Indonesia-Malaysia	Phenomenological approach	3.3
28	Journal of Universal Computer Science, 29, 10 (2023) (Ezzaim et al., 2023)	Several countries	Systematic mapping of the literature	3.2
29	Journal of Applied Learning & Teaching, Vol.6 No.2 (2023) (Osamor et al., 2023)	Uganda	Exploratory and interpretive	3.2
30	Sustainability 15, 2023 (Kooli, 2023)	Canada	Qualitative methodology	3.2
31	Contemporary Educational Technology, 15 (2) 2023 (Halaweh, 2023)	Several countries	Literature review	3.2
32	Education and Information Technologies 28 (2023) (Nguyen et al., 2023)	Several countries	Thematic analysis	3.1
33	Computers and Education: Artificial Intelligence 4 (2023) (Kim & Kwon, 2023)	South Korea	Explanatory sequential design	3.3
34	Journal of University Teaching & Learning Practice, Volume 20, Issue 3 2023 (Crawford et al., 2023)	Australia	Qualitative research study	3.2
35	Contemporary Educational Technology, 15(3) 2023 (Adiguzel et al., 2023)	Türkiye	Comprehensive overview	3.3
36	Computers and Education: Artificial Intelligence 4 (2023) (Chiu et al., 2023)	Several countries	Systematic review	3.1
37	Indonesian Journal of Electrical Engineering and Computer Science Vol. 32, No. 2, 2023 (Ndungi & Siregar, 2023)	Kenyan	Mixed-method research	3.1

38	International Journal of Learning, Teaching and Educational Research Vol. 22, No. 12, 2023 (Liu et al., 2023)	Russia and China	Innovative method	3.2
39	Smart Learning Environments 10:15 (2023) (Tlili et al., 2023)	Several countries	Case study	3.2
40	Innovations in Education and Teaching International, Vol. 61, No. 3, 2024 (Farrokhnia et al., 2024)	Netherlands	SWOT analysis framework	3.3
41	The International Journal of Technologies in Learning, 31, 2, 2024 (Hmoud & Shaqour, 2024)	Palestine	AIEd Bloom's Taxonomy Research	3.3
42	Journal of Computers in Education 2024 (Yim & Su, 2024)	Several countries	Scoping review	3.2
43	Expert Systems with Applications 252, 2024 (Wang et al., 2024)	Several countries	Systematic literature review	3.2
44	Education and Information Technologies 29 (2024) (Velander et al., 2024)	Sweden	Qualitative content analysis	3.3
45	International Journal of Learning, Teaching and Educational Research, Vol. 23, No. 6, 2024 (Abu-Haifa et al., 2024)	Several countries	Quantitative	3.2
46	Open Praxis, 16, 1, 2024 (Bozkurt, 2024)	Several countries	Investigative research	3.2
47	IAES International Journal of Artificial Intelligence (IJ-AI) Vol. 13, No. 3, September 2024 (Wahjusaputri et al., 2024)	Indonesia	Mixed-methods approach	3.3
48	International Journal of Information and Education Technology, Vol. 14, No. 5, 2024 (Turmuzi et al., 2024)	Indonesia	Quantitative and qualitative	3.3
49	International Journal of Religion Volume: 5, Number 2 2024 (RH, 2024)	Jordan	Investigative research	3.1
50	Internet of Things and Cyber-Physical Systems, 4, 2024 (Gill et al., 2024)	Several countries	Qualitative	3.1

3.1 The Concept of AIED in Elementary School Nationalism Education

AIEd is the integration of AI with education to enhance learning through AI-based technologies developed by education technology (EdTech) startups (Bhutoria, 2022), and integrated with Google and Facebook, which are investing significantly in AIEd for education and nationalism in primary schools (Ndungi & Siregar, 2023). AIEd evolved from idealized laboratory scenarios to more complex real-life learning contexts (Guan et al., 2020). AI is a form of technological intelligence that is the philosophy relating to machines' ability to think, behave, and cooperate similar to humans. It is used in primary school education and learning (Dhamija & Bag, 2020), including assisting in managing human resources through nationalism education (Berhil et al., 2020). AIEd is a model and learning tool for nationalism education because it enhances collaborative inquiry, creativity, emotional control, computational thinking, and literacy skills (Su & Yang, 2022), thereby driving socioeconomics, democracy, and nationalism in elementary schools (Jiang et al., 2022).

AIEd is the integration of AI technology with curriculum and lesson design, learning systems, student skills, and assessment (Al-Qawabah, 2024). Such an example is ChatGPT, an AI device similar to a digital educator capable of answering questions, integrating with devices, smartphones, and IoT, and supporting student group work in nationalism subjects (Gill et al., 2024). AIEd is an alternative to DL in social humanities, including nationalism education through the application layer (feedback process, reasoning, adaptive learning) and integration layer (compassion computing, role-playing, deep learning, and gamification) (Xuesong et al., 2021) as well as the application of AIEd in learning planning, implementation, and assessment (Chiu et al., 2023). AIEd is a technological breakthrough in education that facilitates education, learning, decision-making, assessment, prediction, guidance, personalized feedback, and decision-making to focus on the needs and demands of students (Tapalova & Zhiyenbayeva, 2022). Besides being easy, AIEd improves learning performance and students' experience in learning nationalism in elementary schools (Nguyen et al., 2023).

3.2 The Features and Types of AIEd

Emerging AIEd features are still around traditional natural language processing AI technologies. At the same time, more advanced techniques are rarely adopted (Xieling et al., 2020), such as intelligent tutors, tutees, learning tools/partners, and policymaker advisors (Hwang et al., 2020). Besides ChatGPT (Halaweh, 2023), ChatGPT-3 (Crawford et al., 2023; Liu et al., 2023), ChatGPT-4, Microsoft Copilot (Abu-Haifa et al., 2024), chatbots, and ChatGPT in education (Tlili et al., 2023), are popular AIEd tools. Furthermore, AI-Writer, Bard, Bing Chat, Botsify, Chat PDF, Claude, Consensus, Copy.ai, Duolingo, and Ebbot by Learnify also enjoy popularity . In addition, Elicit, Ernie, Essay Writer, Jasper AI, Jenni AI, Laser AI, Lateral AI, Ludwig, PaperPal, Plaito, Querium, Quillbot, Research Rabbit, Scholarcy, SciSpace, Wisio, Wordtune, Writely AI, ALEKS, Deakin University's Genie, and Pounce Chatbot (Osamor et al., 2023; Kooli, 2023) are also widely used. Some AIEd features are transposition namability, calculability, measurability, and representability. Meanwhile, the application of AIEd predominantly uses four methods: machine learning (ML), deep learning (DL), neural nets, and quantum computing (Cope et al., 2020).

The integration of academia and industry gave birth to AIEd, which impacts industry, policy, research, and education by offering AIEd features for self-learning, precision education, assessment, learning development, interpretation, and algorithm validation (Luan et al., 2020). From its evolutionary stage, AI types evolved from simple (narrow), general AI, to super intelligent AI classified into analytical, human-inspired, and humanized AI depending on cognitive, emotional, and social competencies (Kaplan & Haenlein, 2020).

AIEd is categorized into three paradigms: Paradigm one relates to AI-directed, learner-as-recipient (AI to support learning while the learner works as a collaborator) while paradigm two reflects AI-supported, learner-as-collaborator (AI empowers learning while the learner takes the agency to learn). Paradigm

three encompasses AI-empowered, learner-as-leader (AI empowerment, learner as leader, which makes the learning agent the core of AIEd) (Ouyang & Jiao, 2021). A good AIEd strategy is the use of fifth-generation (5G) e-networks that cannot be separated from the development of ML, AI, and DL. Their use was estimated in 2025 to be 100 billion, with an accumulated 2.5 billion using more than one gigabyte (GB) of data per month (Hassan et al., 2021). Popular AIEd applications in education are chatbot systems in various forms (Okonkwo & Ade-Ibijola, 2021), explainable AI in education (EAI-ED) (Khosravi et al., 2022), AI applications such as expert systems, conversational agents, recommendation systems, virtual learning environments, intelligent tutoring systems, and adaptive learning (Ezzaim et al., 2023). Also popular are Google's teachable machine, Learning ML, Machine Learning for Kids, Pop Bots, Scratch, Python (Yim & Su, 2024), Khan Academy, Duolingo (Wang et al., 2024), generative AI, and large language models (LLMs) (Bozkurt, 2024).

3.3 Implementation of AIEd in Elementary Nationalism Education

The implementation of AIEd in China began in 2017 as an integrated national strategy in nationality education developed by three companies: Tomorrow Advancing Life (TAL), Squirrel AI, and New Oriental Group (Knox, 2020). The use of AIEd requires integration with TPACK (Kom & Kwon, 2023; Velander et al., 2024), with genres of deep learning, predictive analysis, ML, neural networks, expert systems, and social robotics in schools to make them more aware of democracy and foster civic awareness in students (Gray, 2020). AIEd combined with movies, puppet media (Hidayat et al., 2020) and comics with local folklore (Murti et al., 2020), strengthening nationalism character education, cooperation, integrity, and independence under the guidance of teachers (Prasetiyo et al., 2020), as well as the use of textbooks for nationalism education that can foster nationalism in elementary school students (Muhtarom, 2020).

AIEd is applied according to Bloom's taxonomy's AIEd model, which consists of six categories: collecting, adapting, simulating, processing, evaluating, and innovating (Hmoud & Shaqour, 2024). The application of AIEd, such as ChatGPT, facilitates students' increased access to information, reduces learning workload, and facilitates more efficient schoolwork and personalized learning in civic education (Farrokhnia et al., 2024). AIEd learning in the K12 school curriculum in Hong Kong is very effective for instilling national character in students as the nation's successors through planning, elementary curriculum, context, product, process, and practical approaches (Chiu & Chai, 2020). In Turkey, AIEd instils national values and ethics in the students' character (Adiguzel et al., 2023). In Indonesia, AIEd is used for inculcating nationalism by strengthening the characteristics of being independent, active, critical, responsible, carrying out obligations as a social society, being democratic, upholding human rights (Trisiana, 2021), practising multiculturalism, strengthening historical awareness and students' nationalism attitudes (Basri et al., 2022), strengthening nationalism in border schools (Suarno et al., 2022), and prioritizing the maintenance of the principles of Pancasila in the digital era (Turmuzi et al., 2024; Wahjusaputri et al., 2024).

4. Conclusion

AIEd integrates AI, technology intelligence, Google, Facebook, smartphones, and IoT with education, curriculum, learning system, student skills, and assessment for learning improvement through AI-based technology developed by education technology (EdTech) startups in learning nationalism in elementary schools. AIED features have evolved from traditional natural language processing AI technologies to more advanced, intelligent tutors, tutees, learning tools/partners, and policymaker advisors. The types of AIEds in elementary schools are ChatGPT, ChatGPT-3, ChatGPT-4, Microsoft Copilot, Chatbots, AI-Writer, Bard, Bing Chat, Botsify, Chat PDF, Claude, and Consensus. Further applications include Copy.ai, Duolingo, Ebbot by Learnify, Elicit, Ernie, Essay Writer, Jasper AI, Jenni AI, Laser AI, Lateral AI, Ludwig, PaperPal, Plaito, Querium, Quillbot, Research Rabbit, Scholarcy, SciSpace, Wisio, Wordtune, Writely AI, ALEKS, and Deakin University's Genie. Also widely used are Pounce Chatbot, ML, DL, neural nets, quantum computing, Google's Teachable Machine, Machine Learning for Kids, Pop Bots, Scratch, Python, Khan Academy, Duolingo, generative AI, and LLMs. The application of AIEd in elementary school nationalism education applies integration with TPACK, deep learning, predictive analysis, ML, neural networks, expert systems, and social robotics in elementary schools in fostering democratic awareness and growing state awareness in students. AIEd is used with a combination of films, puppets, comics with local folklore, textbooks, and other sources for nationalism character and integrity education.

Implementing AIEd is done through Bloom's taxonomy's AIEd model (collect, adapt, simulate, process, evaluate, and innovate) with planning, elementary curriculum, context, product, process, and practical approaches. Nationalism is being learnt by inculcating independent, active, critical, and responsible citizens, carrying out their obligations in a democratic social society, upholding human rights, practising multiculturalism, and having historical awareness and nationalist attitudes by maintaining the principles of Pancasila in the digital era. The local environment influences the educational context, including norms, customs, and social values that must be considered when designing AIEd. This research notes that AIEd should be designed to understand and respect local nuances, for instance, by presenting learning content relevant to local traditions or issues. This research is limited to reviewing only Scopus-indexed scientific literature published in 2020-2024. Further research is recommended to examine AIEd in nationalism education in elementary schools empirically with the latest types of AIEd. This research recommends that AIEd be implemented to create adaptive learning content related to elementary school nationalism values, such as AI-based educational games that teach national history.

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