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The Trend of 'Cyber Technology Ethical', 1996-2021 in Elementary School: Bibliometric Approach

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Abstrak

Transformasi riset tentang *cyber* pendidikan budi pekerti mengenai Pendidikan Agama Islam dari tahun 1996 sampai 2021. Tujuan dari riset ini agar mampu dieksplorasi tentang penerapan budi pekerti pada peserta didik khususnya pada sekolah dasar dan menganalisis *trend* publikasi Pendidikan Agama Islam di sekolah dasar di era abad yang ke-21. Metode penelitian yang dilakukan melalui penelitian kualitatif dengan mengoperasikan aplikasi VOSviewer dengan berbagai analisis seperti bibliografi yang dikaji dalam hal kata kunci, jurnal, penulis, serta referensi kutipan mulai dari tahun 1996-2021. Informasi tersebut diperoleh dari database Science Citation Index Google Scholar. Metodologi kualitatif digunakan dalam penyelidikan dengan menggunakan aplikasi Vosviewer dan Nvivo plus 12. Hasil penelitian tentang *trend cyber* pendidikan menunjukkan bahwa pendidikan karakter masih jauh dari harapan menuju masyarakat 5.0. Kesimpulan dari riset menggambarkan bahwa peserta didik harus dijadikan sebagai aspek yang dominan menuju era industry 4. 0 menjadi masyarakat 5.0 sebagai generasi penerus bangsa khususnya di kalangan sekolah dasar. Implikasi yakni adanya *trend* terbaru yang tidak terlepas dari bentuk wajah Pendidikan digital terbaru yang bercorak pada aspek berbudi pekerti dan terintegrasi pada di era yang masa akan datang.

Kata Kunci: pendidikan *cyber*, Pendidikan Islam, bibliometriks, teknologi

Abstract

Transformation of research on cyber character education regarding Islamic education from 1996 to 2021. The purpose of this research is to find out the implementation of character education for students, especially in elementary schools, and analyze the trend of publication of Islamic education in elementary schools in the 21st century. The research method used is qualitative research using VOSviewer application analysis in bibliographic reviews taken from the most productive authors, journals, keywords, and citation references analyzed from 1996-2021. The information was obtained from the Google Scholar Science Citation Index database. Qualitative methodology was used in the investigation using the Vosviewer and Nvivo plus 12 applications. The results of the research on the cyber trend of education show that character education is still far from the expectations of society 5.0. The conclusion of the research illustrates that students must be made a top priority in welcoming the industrial era as the nation's next generation, especially in elementary schools. The implication is that there is a contribution in the latest innovation model that cannot be separated from the role model of education that is virtuous and integrated in the future era.

Keywords: *cyber technology; Islamic education; bibliometrics; technology*

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INTRODUCTION

Advances in cyber technology have created point issues in governmental, financial, and educational institutions and among socio-demographic groups, including the rich and the poor, gender, and developed and developing countries. One of the most serious challenges is the question of cyber ethics (Barber, 2011). The term "cyber ethics" refers to proper online conduct (Bowen, 2012). Cyber terrorism and warfare, government cyber espionage, plagiarism in educational institutions, financial institution cybercrime, cyber fraud, and corporate computer misuse are all instances of cyber ethics issues (Kaino, 2012). Cyberethics, "investigate of moral, lawful, and social matters surrounding cyber advanced technologies," has gotten much attention in recent years. "A broad scope of computational equipment, from self-contained computer systems to connected or clustered processing and communications processes," according to cybersecurity." (Davis et al., 2013)

Numerous institutions, especially medical schools, have been harmed by the COVID-19 outbreak in terms of education. To protect students, teachers, and patients, many nations, including Poland, have been forced to stop doing traditional face-to-face classes (Barber, 2011). To mitigate the impact of lockdowns, medical schools have created new ways to educate medical students. Fortunately, during the COVID-19 pandemic, today's technology made electronic learning the primary way of curriculum instruction. Automation, as well as cyber innovations, are combined in the field of "industry 4.0." Automation is becoming more prevalent in manufacturing innovations such as cyber-physical processes, the Internet of Everything (IoT), cloud services, and cognitive technologies. and data interchange. Industry 4.0 produces "smart factories" (Tomei, 2010). Cyber-physical systems can monitor physical laws, create virtual duplicates of the material realm, and make decisions in a reconfigurable structured smart factory. Computer crime systems connect and work together with humans at the same time through the internet for everything (IoT) (Kawano, 2016). Computer crime systems connect and work together with humans at the same time through the internet for everything (IoT).

Islamic Education is the use of technology to improve education quality. The online teaching system is now being used in graduate education as a single method and in conjunction with traditional instructor approaches (Frehner, 2019). Accessibility, the utilization of relevant tools, course content, and evaluation criteria are all important factors in Islamic Education success (Bosman & Zagenczyk, 2011). Islamic education, like any other method of instruction, has advantages and disadvantages for both students and instructors. Aside from the epidemiological benefits of Islamic education during the COVID-19 pandemic, other advantages worth mentioning include improved comfort, access to resources at any time or place, cost savings, and a reduction in air pollution, such as reduced carbon dioxide emissions from reduced traffic.

Cybersecurity is becoming increasingly important in primary school educational institutions. An organization can spend a lot of money on marketing a cybersecurity system, and so should educational institutions, especially at the most basic level, namely elementary schools (Almuhaideb & Saeed, 2020). Cybersecurity type of behavior, also known as well as cyber hygienic practices, is frequently discussed in scientific journals and by decision-makers (Cobo et al., 2018). Nevertheless, no clear definition of this term has been found in scientific work. This study is based on a modified definition of information security behavior as "internet security procedures that online customers should adopt to protect the security and integrity of personal learning and related institution information on world wide web devices from being infiltrated in hacking attacks."

Cybersecurity is a broad concept (Karmini, 2016). Besides the technical viewpoint, there really are ethical, cultural, and diplomatic perspectives on information security (Norris, 2001). The same focus of this study is on sentient information security behavior, as cyber-criminals today market in terms of system users (Assidiq et al., 2020). Previously, cybercriminals focused on the users of the system were using (Syarif et al., 2021). Moreover, the most serious issue is not new tech security, but rather risky behavior among information system users. According to research, human error is involved in 95% of security incidents. This is due to the fact that teachers

and staff in research universities, particularly preschools, are encouraged to use innovation both at home and at work, but they are not adequately trained to recognize the possible risks and how to reduce or avoid them (Dewi et al., 2021). There are other limitations in online classrooms, such as internet access concerns, inadequate Internet connectivity, and respondents' limited digital capabilities. Some advantages, such as time flexibility, may also be a constraint (Wittstrom et al., 2010), particularly for students with poor self-discipline. According to various published studies in the scientific field of proof education in digital technologies, it is crucial to review the current state of having to acquire cybersecurity behavior in public schools and to assist in the creation of a new curriculum for obtaining cybersecurity behaviors. The researcher attempts to provide the first response to the following question: In elementary schools, to what extent do students can develop cybersecurity behavior?

RESEARCH METHOD

The survey was conducted on the previous year's group of elementary school students (aged 20 to 23 years) using a combination of reference searches from published data. To avoid copying errors, the Google Forms app is used for surveys. In grades IV and VI, students receive links from their teachers to complete surveys. As a result, the researcher did not see the students' names. Data that can be used to identify the student is saved. To ensure that data accumulation went smoothly, the research scientist (i.e., the first author) was physiologically or virtually present during the survey. The data comes from all primary school-published research in Southeast Asia and around the world. A literature study design with a systematic and overt mapping method is used in this study. In this study, qualitative case studies are employed to approach the research in order to comprehend how Islamic religious schooling is Islamic religious education in primary schools in the cyber era, particularly in internal documents (Kivunja, 2015). The object to be studied, not the research methodology, is the direct example; researchers can examine the object using a variety of techniques. This study employs a qualitative research method. Data was gathered through quasi-interviews. The researchers organized the participants into a WhatsApp group and gave them instructions. He or she must understand the data in aspects of the breadth and depth of the question-and-answer session, as well as continuously recheck the original audio recording for authenticity. The utterance would be the moment, frustrating, and gradual; thus, data is the only efficient method to become familiar with it. After analyzing the data, the research conducted it into themes to better understand the pattern (Frehner, 2019). Throughout the data promotion company activity and analytical process, pay careful attention to groups or categories of things that go together. The researcher now must refocus the inquiry on the broad level of motive. Rather than concentrating on the code, a broader theme will display the separation of code differentiations into an efficient topic by trying to sort all data extracts to ensure that the software becomes significant in the purview of Islamic religious school education social and emotional learning progress toward classroom training in Primary School through a co-citation evaluation from 1996 to 2021.

On March 17, 2021, Muhammadiyah University in Enrekang proclaimed a state of emergency, putting all academic institutions on lockdown. All departments at Enrekang's Muhammadiyah University were required to use only Islamic education. After 8 weeks of online learning with WA, Zoom, Learning Control System, and User science and education student forums, students' preconceptions were collected anonymously. From July 21 to Feb 21, 2021, the survey was available online through a management system for learning and other tools. There were no available exclusion criteria. Each student could only complete the questionnaire once. The study's objectives were explained to all participants, who voluntarily agreed to take part. Muhammadiyah University in Enrekang, Indonesia, had 184 students.

This study is all about Islamic education in primary schools in the cyber era, and the device developed consists of two parts that serve as the main variables: trying to teach materials and resources and basic competencies. Data collection tasks are carried out during the survey stage from sources of data decided based on the issues studied (C et al., 2020). The data is then processed and analyzed using a content analysis method. Tabulating data based on research problems is used to carry out the steps for presenting and drawing

conclusions. Tables and narratives are used to present research findings. The provision that teachers of Islamic religious education subjects in elementary schools who become data sources are teachers of Islamic religious education subjects limits the characteristics of data sources or participants. The technique used to collect data is indirect data collection. As a data collection tool, a questionnaire instrument was used. Data analysis in general entails attempting to interpret data in the form of text or images. Based on the actual research conditions in the context of implementation (ALRowais, 2014).

RESULT AND DISCUSSION

Result of the research



Figure 1. Respondents

Figure 1 shows how the respondent was chosen from a group of 184 students. The researchers also carried out a basic random survey of the study population at the elementary school departments of the Muhammadiyah University of Enrekang. The researcher employed the Systematic Review method. SLR is a useful type of study that abides by scientific methods by "trying to identify to classify, analyze, and synthesize the best available information concerning the research goal, to provide "informative and evidence-based" results via N Vivo Plus 12 during this ongoing pandemic. In the current study, 184 teenagers (112 male and 72 female) participated in cyber technology through learning management systems, WA, Facebook, Zoom, and other platforms.

Figure 1 depicts how educators in the primary school education study program exercise caution when using the internet. They do not, for example, disclose personal information with fellow students, do not click on hyperlinks in email messages, and do not allow access to email attachments before even weighing the risks. In addition, they do not use the internet to get everything they want in school. When students in the elementary school schooling research study program met stuff strange internet, the majority of them discussed it with their parents. However, they install everything they need for on-campus tasks assigned and do not lock their electrical gadgets. They begin to score lower when they check this same privacy setting of one's social media accounts regularly. Elementary primary school teachers and students who perform well in terms of user acct behavior, using strong passwords, and having separate passcodes for social networking and classroom accounts. They also fail to assess the site's security adequately, but the grading system was inadequate to make them consider the bad repercussions before posting on social media.

There is almost no difference in the results among boys and girls (figure 1). There is no substantial difference between both the responses of boys and girls in the primary school study students enrolled with measured the survey of 184 young teens (112 males and 72 females). Boys outperformed girls in identifying phishing websites as well as emails in elementary school. Boys performed better when it came to informing one's parents something strange had occurred online.

Table 1
The components of the student's perception of learning during covid-19

Components	Frequencies	percentages
The use of technology in learning management systems by the department has an impact on new communication technologies	42	22.8%
The use of new communication technology in cyber technology	50	27.2%
New communication technologies used the cooperation of lectures at Muhammadiyah University of Enrekang	52	28.3%
An improvement of new communication technologies to classify students' perception	40	21.7%
Total	184	100%

Students judged themselves to be less engaged during cyber technology than in regular courses, as seen in table 1. The department's use of technology in learning management systems has a 22.8 percent impact on new communication technologies, and 27.2 percent of new communication technology is used in cyber technology. The utilization of new communication technologies in lecture collaboration at the Muhammadiyah University of Enrekang is 28.3 percent. The use of modern communication tools to categorize students' perceptions has improved by 21.7 percent. One of the reasons could be a lack of an interactive approach to Islamic Education course development. Only 10% of respondents cited class involvement as an advantage of Islamic Education during the COVID-19 epidemic. Islamic Education strategies that are less engaging are viewed poorly. There are several ways to make cyber technology more interactive (Balim, 2009). This strategy aids students in communicating professionally with one another and lecturers. They should collaborate in an open forum to share ideas and broaden their understanding (Bowen, 2012). The student must make a decision and then present the consequences of that decision. There are new problems and possibilities with each selection. This method has been associated with better learning results, including greater comprehension and clinical reasoning.

One of the original study's flaws is the low response rate. In comparison to the total amount of medical classmates in Poland, 84 participants is a small number. To ensure the security of all attendees (due to the study's confidentiality and voluntary nature) and to reduce biases in our findings, the poll didn't ask where each young person attends college. As a result, it is impossible to rule out the possibility of institutional prejudice.

Discussion

Throughout history, revolutions have taken place when technology and new ways of making sense of the world stimulated significant changes in economic structures and social structures. From renewable power to quantum computing, nanotechnology is changing the world. During the COVID-19 epidemic, a poll was conducted to assess students' perceptions of cyber technology. The ability to study when and where you want, as well as easy access to instructional materials, were rated as the most significant benefits of cyber technology by respondents in our poll. Remote access is critical during the COVID-19 outbreak, but it can also help reduce lodging and transportation costs in other situations (Bosman & Zagenczyk, 2011). Learning materials can be provided to students quickly, standardized, and, if necessary, modified through Islamic Education (Elihami, 2020). Independent learning and instructor-led learning are two approaches to imparting knowledge to students (Syaparuddin & Elihami, 2020). Students can organize their activities with independent Islamic education. Independent Islamic education has the potential to surpass traditional face-to-face instruction.

The goal of this study was to see how much cybersecurity behavior students in Muhamamdiyah Enrekang University's primary school study program demonstrated in elementary schools. A survey finished by students in elementary school and interviews with other study students enrolled discovered that on average, students of Muhamamdiyah Enrekang University's primary school study program demonstrated better performance in terms of secure email behavior, login behavior, phishers awareness, as well as physical locking of something like the

device. Students in Muhamamdiyah University Enrekang's primary school study program, on the other hand, exhibited more reckless security behaviors while using the internet over time and rarely shared any unusual experiences online with their parents. Students from the Muhammadiyah University of Enrekang primary school study program exhibited security behavior, and students from other study programs checked their privacy settings regularly. Boys outperformed girls in recognizing phishing websites and emails among Muhamamdiyah University Enrekang primary school study program students. Girls outperformed boys when it came to informing their parents about unusual online experiences. Humans were shocked to discover that the education system is falling alone in such an important knowledge domain, given that cyberattacks are front-page news on a daily basis. Due to the importance of the topic and the fact that kids are already revealed to online threats, a proper information security curriculum should be required on their campus. Learning at a younger age is advantageous. Teaching at a relatively young age is more likely to result in highly skilled grownups.

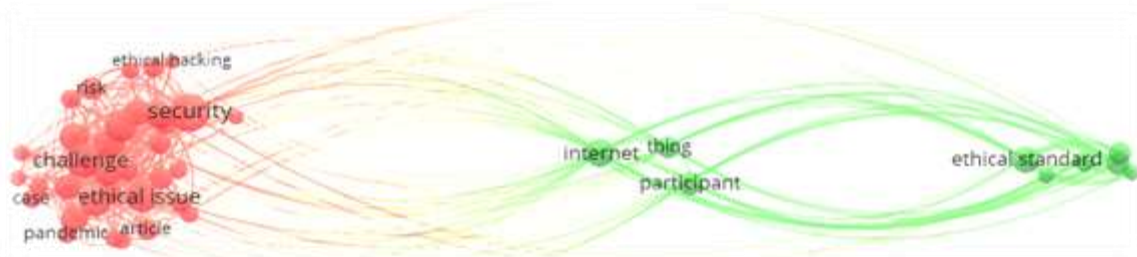


Figure 2. Network Vizualitsation

As depicted in figure 2, learning is a technological transition that began with the widespread use of computers and the establishment of a classification system for students' perceptions. By using a rising number of mobile devices in their daily activities, students' perceptions of technology have become an important aspect of technology. In this example, Islamic Education was crucial in changing the attention away from technology misuse and toward a good Islamic Education platform (Warren, 2016). There are several drawbacks to Islamic Education (Oliver, 2007). The main problem for respondents to the survey at the Muhammadiyah University of Enrekang, especially students in the Non - formal Education Department in their fifth and sixth years of study, was a lack of participation with patients. This finding is consistent with previous research that examined how people felt about virtual classes throughout the pandemic (Abu-Rabia, 1997). Nonformal education programs have been eliminated in many academic institutions. Based on patient learning inside a school environment is essential for schooling, and cyber innovation cannot completely replace it (Abidah et al., 2020). To some extent, the usage of Islamic Education and LMS at the Muhammadiyah University of Enrekang could solve this problem. Learning Management Systems (LMS) are meant to imitate real-life clinical scenarios and allow students to prepare for different types of education (Keramati et al., 2011).

Surprisingly, more than 72% of those who responded to our survey had never used any Islamic Education before the COVID-19 epidemic, which could explain why technical concerns were ranked as the second most significant drawback of Islamic Education in our study (González & Batanero, 2016). Islamic Education necessitates a stable internet connection as well as the appropriate hardware and software. Before and throughout an online course all students and educators should be acquainted with the equipment, and the IT dept should provide technical assistance and guidance. Self-learning requires self-discipline on the part of the student, which can be difficult to attain without direct supervision of the teacher (Akyol & Garrison, 2008). Our research group concluded that Islamic Education provided them with the same level of knowledge as traditional learning (Huang & Wang, 2012). They presume, however, that Islamic Schooling is ineffective at improving their health and social skills. Among the other challenges of a Fourth Industrial Revolution are as follows: 1. Safety The risk of IT security to production plants, including academic institutions, represents the most difficult aspect of Industry 4.0. (Akhmadeeva et al., 2013). This requires the gathering will open the door to security

and more encouraging employee participation are needed to accurately integrate cyber technology into education. The purpose of this research is to provide a comprehensive analysis of confronting Islamic education in the face of the "Cyber Technology Ethical" trend between 1996 and 2021. The data was compiled using Google Scholar's Science Citation Index database. The investigation was conducted using the Vosviewer application and a qualitative approach. All of the files, Headlines, author allegiances, and accompanying documents were managed to recover and ended up saved to an excel spreadsheet. There were a total of 25 articles published, with 9033 citations. The majority of the results (n = 201) were published between 1996 and 2021. Scientists and financial institutions interested in Islamic education can benefit from bibliometrics analysis.

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