



## Technology literacy training for school-age children in anticipation of the Industry 4.0 era in Batuloceng Village, Suntenjaya, Lembang

Sri Dewi Rahayu Nurgianti<sup>1</sup>, Balqis Zahra Nabilah<sup>2</sup>, Yustika Rossa<sup>3</sup>, Oktafiani<sup>4</sup>, Salima<sup>5</sup>

<sup>1,2,3,4,5</sup>Universitas Pendidikan Indonesia, Bandung, Indonesia

[dewisri@upi.edu](mailto:dewisri@upi.edu)<sup>1</sup>, [zahrabalqis@upi.edu](mailto:zahrabalqis@upi.edu)<sup>2</sup>, [yustikarossa2401@upi.edu](mailto:yustikarossa2401@upi.edu)<sup>3</sup>, [oktafiani@upi.edu](mailto:oktafiani@upi.edu)<sup>4</sup>,  
[salimaazzahra@upi.edu](mailto:salimaazzahra@upi.edu)<sup>5</sup>

### ABSTRACT

Now we have entered the digital era, where every individual must be able to use technology well. In addition to daily needs, the education sector is one of the fields that require the use of technology. Suntenjaya Village, as a tourist village, has abundant natural wealth and beautiful scenery, so children often play in the open. The habit of children in Batuloceng Village is playing in the open. They rarely or never even operate computer devices and devices. This has a positive impact. Namely, children are not dependent on gadgets. Still, on the other hand, technology is also very much needed for their future careers. This community service activity aims to introduce computer technology (laptops) to children in Suntenjaya Village. This activity is one of the efforts to be literate in technology in the digital era. The method used is technology literacy training to empower the community. The result of this training was that there was an increase in the ability of children, who at first did not know how to operate a laptop and after the training knew how to turn on and off a computer, type in a word processing application, and surf the internet via a computer.

### ARTICLE INFO

#### Article History:

Received: 30 Mar 2023

Revised: 4 Jun 2023

Accepted: 11 Jun 2023

Available online: 16 Jun 2023

Publish: 22 Jun 2023

#### Keyword:

Industrial era 4.0; information technology introduction; school-age children; technology literacy training

#### Open access

Dedicated: Journal of Community Services (Pengabdian kepada Masyarakat) is a peer-reviewed open-access journal.

### ABSTRAK

Saat ini telah masuk pada era digital, di mana setiap individu harus bisa menggunakan teknologi dengan baik. Selain kebutuhan sehari-hari, bidang pendidikan merupakan salah satu bidang yang memerlukan penggunaan teknologi. Desa Suntenjaya sebagai desa wisata memiliki kekayaan alam yang sangat berlimpah dan pemandangan yang sangat indah sehingga anak-anak sering bermain di alam terbuka. Kebiasaan anak-anak di Kampung Batuloceng bermain di alam terbuka, mereka jarang atau bahkan tidak pernah mengoperasikan gawai dan perangkat komputer. Sebenarnya ada dampak positif dari hal tersebut yaitu anak-anak tidak ketergantungan gawai, tapi di sisi lain penggunaan teknologi juga sangat dibutuhkan untuk karir mereka di masa depan. Tujuan dari kegiatan pengabdian ini adalah untuk mengenalkan teknologi komputer (Laptop) kepada anak-anak di Desa Suntenjaya. Kegiatan ini sebagai salah satu upaya untuk melekat teknologi di era digital. Metode yang digunakan adalah pelatihan literasi teknologi sebagai upaya pemberdayaan masyarakat. Hasil pelatihan ini yaitu terjadi peningkatan kemampuan anak-anak, yang pada awalnya tidak mengetahui cara mengoperasikan laptop dan setelah pelatihan mengetahui cara menyalakan dan mematikan laptop, mengetik di aplikasi pengolah kata, serta menjelajahi internet melalui laptop.

**Kata Kunci:** Anak usia sekolah; era industri 4.0; pelatihan literasi teknologi; pengenalan teknologi Informasi.

### How to cite (APA 7)

Nurgianti, S. D. R., Nabilah, B. Z., Rossa, Y., Oktafiani, O., & Azzahra, S. (2023). Technology literacy training for school-age children in anticipation of the Industry 4.0 era in Batuloceng Village, Suntenjaya, Lembang. *Dedicated: Journal of Community Services (Pengabdian kepada Masyarakat)*, 1(1), 69-80.

### Peer review

This article has been peer-reviewed through the journal's standard double-blind peer review, where both the reviewers and authors are anonymised during review.



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## INTRODUCTION

Information and Communication Technology (ICT) encompasses all technical needs for processing and delivering information in two aspects: information technology and communication technology. Information technology includes all forms of processes, the use of tools, information processing, and information manipulation. Meanwhile, communication technology relates to the use of tools to process and transmit data from one device to another (Dewi & Khumaidi, 2017). In the annex of Peraturan Menteri Pendidikan dan Kebudayaan Republik Indonesia No. 103 of 2014, regarding the principles of learning, it is stated that to achieve the desired quality and enhance the efficiency and effectiveness of learning, learning activities must utilize the principles of ICT utilization.

The presence of Information and Communication Technology (ICT), including computers and the internet, provides convenience for people in various parts of the world to share information and interact quickly and efficiently, without being constrained by location or language differences (Misbahruddin, 2014). In the current digital era, technology is developing rapidly. People are required to be more responsive to technological advancements. With technology, human life is perceived to be easier (Rupilele *et al.*, 2021). For example, when we are reluctant to cook at home, we can use a mobile phone to order food through an online app. Not only can we order food, but we can also pay various bills, shop, and more, all through apps on our phones. Another benefit of technological advancements is that when someone is sick, they can consult with a doctor online and receive a prescription for medication, which can also be purchased online through Telemedicine (Bahtiar & Munandar, 2021).

During the KKN Tematik in 2022, group 76 agreed to conduct their KKN in Suntenjaya Village, specifically in Batuloceng Village RW 10. The lack of knowledge about technology in Batuloceng Village, Suntenjaya, is a serious issue that impacts social life. Although the advancement of information and communication technology has changed the way we live and interact, many people in rural areas still lack adequate access to or understanding of this technology. This results in a digital divide between urban and rural areas, limited access to information, and low participation in technological development. Furthermore, a lack of technological knowledge can hinder the village's economic growth, reduce job opportunities, and limit its potential for local economic development. Therefore, it is crucial to identify the factors contributing to the lack of technological knowledge in the village and to seek practical solutions to address this issue.

Suntenjaya Village is one of the villages in West Bandung that has beautiful natural wealth, which is why it has been designated as a tourist village (Sitorus *et al.*, 2021). During the KKN activities in Batuloceng, the author observed how the children there go about their daily lives. It was noted that children in that environment rarely use electronic devices, such as mobile phones, laptops, and computers. The majority of the people in Batuloceng Village earn a living as farmers, traders, and livestock breeders. As a result, the community, including the children, is not very familiar with electronic devices. The children tend to play traditional games in the open air because their home environment is still very natural. Some of them claimed to be familiar with electronic devices, such as laptops, but they had never actually used them. The village community has a high demand for information, but this is hindered by a lack of understanding of information technology (Asmara, 2019).

As times have progressed and entered the digital era, skills and knowledge regarding technology are greatly needed, especially as a medium for learning. However, based on the author's field observations, the children in Batuloceng Village still have limited knowledge about electronic devices, resulting in them lagging in accessing digital education. Moreover, the skills and knowledge in the IT field are essential for their future. This was also highlighted in the article by Upa and Pilu (2021), which conducted training and introduced the basics of computers to elementary school children in Temmalebba Village. According to observations made of the children and their parents, it was noted that most children possess very minimal technological skills. However, these children are required to engage in online learning due to the COVID-

19 pandemic. Following the training, the activities received positive feedback and successfully achieved the initial objectives. In line with this, [Ariasih et al. \(2019\)](#) also introduced information technology in the digital era. The training was carried out in Susut Village, Bangli Regency, Bali Province. Prior to this, observations were made within the community, revealing that learning groups were used as a platform for children to play and learn. The results of the observations indicated that the children were still not very familiar with digital technology. Upon realizing this, training was conducted on the use of digital documents, specifically Microsoft Word, as well as an introduction to the internet. The results indicate a positive response from the founder and chairman of the learning garden. Additionally, the objectives of the activity were successfully achieved, and the delivery of the material was well received by the students.

In line with the existing issues, the service team attempted to provide technology education as part of their community service program. This is because the community of Suntenjaya Village, especially the children, is not very familiar with technology, placing them at a disadvantage compared to other children. By introducing IT to the children, it is hoped that they will receive some training so they do not fall further behind their peers who have the privilege of learning about technology and accessing digital learning media. Furthermore, it is also hoped that the children will begin to become tech-savvy and develop a desire to learn more about it in the future.

## **Literature Review**

### **Literacy**

Literacy, in general, refers to the ability to read and write. The development of literacy is crucial to consider, as it is a fundamental skill that every individual must possess to face the future. On the other hand, there is also the term technological literacy, which refers to the ability to understand how machines work. Essentially, human literacy is related to the ability to communicate, collaborate, think critically, create, and innovate ([Ng et al., 2022](#); [Rachmadtullah et al., 2020](#)). There are also studies on the application of blockchain in the field of education that can enhance the motivation of both learners and educators, improve the effectiveness of the teaching and learning process, and facilitate job seekers in finding employment while helping recruiters identify suitable candidates that match job criteria ([Augusta et al., 2021](#)). This supports the rationale for the importance of technology literacy training.

### **Information Technology**

Information technology is a set of tools that can assist individuals in performing their tasks, and it is not limited to computer devices for data processing and storage, but also includes the delivery of information to learners ([Triyono & Febriani, 2018](#)). The effectiveness of online learning can still be improved if the existing issues are minimized, and there is a need to enhance student motivation to increase the outcomes of online learning as well ([Ghifari et al., 2022](#)). Information and communication technology literacy is the skill of using digital technology, communication devices, and networks effectively to solve information problems and participate in an information-based society ([Chatwattana, 2021](#); [Kim et al., 2021](#)). The ability to use information and communication technology literacy encompasses the use of technology as a tool to search for, organize, evaluate, and communicate information, as well as a basic understanding of the ethical and legal issues related to accessing and using information. Additionally, it is stated that information and communication technology literacy encompasses technical skills and the ability to manage information that an individual needs to communicate and obtain information through computers and other technologies ([Imran, 2010](#)). Information and communication technology literacy involves the effective use of technology applications across various aspects of life.

## **The Era of Industry Revolution 4.0**

The Industrial Revolution generally occurs when substantial social, economic, and cultural changes follow significant technological advancements. In the era of Industry 4.0, there is a strong integration between the digital world and the industrial sector. The Industry 4.0 revolution describes a digital era in which all machines are connected through the internet or cyber networks. This situation brings about significant changes in society (Syamsuar & Reflianto, 2019). In the era of Industry 4.0, the development of digital technology has transformed and influenced various aspects of human life, including education. Digital technology has become the most significant influence in the current education system. This is due to the effectiveness, efficiency, and appeal that digital technology-based learning offers. Nevertheless, the use of technology in learning is unavoidable, and there is a belief that technology can have a positive impact if used wisely (Putrawangsa & Hasanah, 2018). The Industry 4.0 revolution integrates the digital world with the industrial sector, bringing about significant changes in society. In this era, digital technology has a significant impact on education and has the potential to yield positive outcomes when implemented effectively.

## **METHODS**

The method employed by the author in this community service activity is training and practice. Training is a process in which individuals acquire job-related skills through a series of structured procedures delivered by an expert to enhance skills and knowledge (Yulianti, 2015). Meanwhile, practice can be defined as the concrete implementation of the theoretical knowledge that has been learned, where an individual applies that theory directly to acquire skills (Mayolo-Deloisa *et al.*, 2019).

In this research, the author aims to describe a current event or occurrence, supported by data collection techniques that include a literature review and observation. The author's initial step was to visit the research location. The chosen location is Batuloceng Village RW 10, Suntenjaya Village, Lembang Subdistrict, West Bandung Regency. The objective of this activity is to introduce electronic devices, specifically laptops, to the children as subjects. 13 children are participating in this activity, aged between 6 and 11 years, spanning kindergarten through sixth grade. The stages of this activity include:

1. Aperception by discussing the existence of technology in today's era, covering its benefits and positive and negative impacts.
2. Practical operation of computers, including how to turn the laptop on and off, performing basic tasks on the laptop such as typing in Microsoft Word, and exploring the internet.
3. Evaluation to determine whether the conducted activities have a positive impact or not.

## **RESULTS AND DISCUSSION**

Batuloceng Village, which serves as the location for the community service team's KKN, is one of the areas that still retains a strong cultural identity and natural ambiance. The children in Batuloceng Village rarely, if ever, play with gadgets, so it can be said that most of the community in Batuloceng Village is not yet technology-savvy. Therefore, the first step the team took was to verbally inform the children that there would be a learning activity to introduce technology as an effort to become more aware of technology in the current digital era. When this was conveyed, they appeared enthusiastic and happy. The activity regarding the introduction of technology took place at Balai Kabuyutan Batuloceng RT. 01, RW. 10 Batuloceng Village, Suntenjaya Village.

To make the activity more focused and clear, the team had prepared in advance by gathering data on the number of laptops that could be used, determining the technical implementation, deciding on the aspects

of technology that would be introduced to the children, and appointing a person in charge for each small group that would be formed later. The technology chosen by the team to introduce to the children of Batuloceng was computer devices (Laptops). This activity was attended by 13 elementary school children aged 6-11 years. To facilitate the activity, the children were then divided into four small groups, each consisting of 3-4 members.

Before introducing the technology, the team provided a brief overview to the children, explaining why understanding technology is important and its significance in today's era. Next, the team introduced fundamental aspects related to laptops, including how to turn the laptop on and off, followed by an overview of commonly used keys on the keyboard and features or applications typically used to ease daily tasks, such as text creation and internet browsing applications.

Some of the applications taught to them include Google, YouTube, and Microsoft Word. The team chose to introduce these three features, considering that these features would be handy and applicable when they begin to enter higher education levels. Not only verbal explanations, but the author also provided the children with opportunities to practice directly with the available laptops so that they could develop skills in operating a computer device (laptop) and understand the usefulness of technology in their lives. In addition to these three features, the author also introduced several other features available on the laptop, such as the camera and Microsoft Paint, at the children's request. Given their high enthusiasm and curiosity, they were eager to ask questions whenever symbols appeared on the screen or buttons caught their attention.

After introducing the children to some of the available features, the author invited them to learn while singing along to a video that had been prepared in advance. A practical method can achieve learning objectives more efficiently, tailored to the characteristics of the learners. One of the methods that children particularly enjoy in learning is singing, as this activity tends to be active, lively, cheerful, and fun. The singing method can be defined as a learning approach that uses songs as a means for children to learn. This approach focuses on empowering students to learn more quickly, effectively, and enjoyably, making the subject matter more meaningful and enhancing memory retention. The learning method through songs is generally used in early childhood education and elementary schools (Qomaruddin, 2017). Additionally, there are several benefits of singing activities, including introducing sound as an element of voice, improving word pronunciation, enhancing language skills such as vocabulary, self-expression, and fluent communication skills, helping children listen, remember, memorize, combine, and produce sounds in language, developing language abilities, serving as a tool and medium for learning, and strengthening existence. Children tend to absorb information or knowledge more quickly with the aid of video media and songs (Lawson-Adams *et al.*, 2022; Morini & Blair, 2021). Children are also presented with a short animated film from which they can derive positive values for application in daily life.

## Introduction to Laptops and Technology



**Figure 1.** Providing Pre-Assessment to Children  
*Source: Author's Documentation 2022*

In **Figure 1**, the team invites the children to form a circle. A total of 13 children are present. In that place, the author provided a pre-assessment to the children before they attempted to use the laptop. Several questions were posed to the children to gauge their prior knowledge about laptops. Additionally, the team provided a brief explanation of the importance of technology in today's era, which is essential to learn about.

Initially, the children were unaware of the significance of using technology in the present time, so the author explained to them that technology is now very close to our lives and, as the next generation, they must know and understand its existence along with the positive and negative impacts that can arise from its use. Technology can be beneficial as a means to help children overcome learning difficulties. The presence of technology can facilitate learners in seeking information and support them in finding learning resources that align with the implemented curriculum (Siboro *et al.*, 2022).

## Laptop Usage Practice



**Figure 2.** Trying to Practice with a Laptop  
*Source: Author's Documentation 2022*

In **Figure 2**, three children are practicing with a laptop. Initially, they were unaware of the existence of a standard text creation application found on computers (laptops) until the author introduced them to Microsoft Word. In principle, the use of Microsoft Word encompasses document creation, storage, and replication (Arsana *et al.*, 2021). The author taught the children, starting with how to open the application, its basic features, and encouraged them to learn typing. One child, a 6th-grade student, was trying to type his name in Microsoft Word. At first, he found it difficult and seemed stiff because it was his first time typing on a laptop. However, after receiving guidance and learning proper typing techniques, he gradually became more accustomed to it.

Laptops have become a basic necessity in people's lives, serving both educational and business purposes (Sanyoto, 2017). The utilization of multimedia, such as laptops and the internet, not only benefits self-directed learning but also aids in collaborative problem-solving. The internet and laptops are very supportive learning media for elementary education, implementing enjoyable learning approaches (also known as "fun learning") (Zabidi, 2019).

## Character Learning through Video Watching



**Figure 3.** Providing video as a learning medium  
*Source: Author's Documentation 2022*

In **Figure 3**, the team continues the activity by providing a video as a learning medium. It can be seen that the children are watching a short animated film that has a character named Riko, titled "Pelindung Bumi." After previously presenting the material through verbal explanations and text, the author attempts to present the material through a video that features engaging visual imagery. It is mentioned that one solution to enhance children's sense of responsibility is by utilizing learning media in the form of animated videos. The use of this learning media can improve the effectiveness of the learning process in conveying messages and lesson content. Animated videos typically convey positive messages through scenes and dialogue within the film (Irawan *et al.*, 2021). In this short animated video, the author aims to teach children positive character traits that can be applied in daily life.

After watching the animated film, the children then learn and sing together about the names of the planets in the solar system. Similar to before, the author also tries to introduce a fun learning medium in the form of a singing video with the topic of the planets in the solar system. The video also presents a visualization of the planets in the solar system, allowing children who previously did not know what each planet looked like to learn about their appearances and even recognize the characteristics of each planet in a short time with the help of the song and the video visualization.

Educational videos are highly effective in influencing children's knowledge and understanding. Before watching the video, the children did not understand the characteristics of the planets. However, after watching it, they became aware of the characteristics of the planets in the solar system (Fuadin *et al.*, 2023). Using music, such as songs, in children's learning has significant benefits in enhancing learning outcomes and the creativity of the learners. Learning through singing helps improve children's memory in recalling educational material. The method of learning through singing also makes it easier for children to remember the material compared to memorization methods (Samsuri, 2018).

At the end of the activity, the team encouraged the children to review the lessons they had learned and understood that day. As a result, the children grasped what had been taught to them, and although this introductory activity only lasted a short time. The material provided was not detailed; however, the children are now at least familiar with a small quantity of technology and can operate basic functions on a computer device (laptop), such as turning the laptop on and off, typing in Microsoft Word, and browsing the internet.

From the overall community service activities conducted, several supporting factors include support from local parties, availability of human resources, availability of necessary facilities, high enthusiasm from the children, positive responses from the children, and the demands of the times. Meanwhile, the hindering factors for the activities include time not aligning with targets due to children arriving late, limited space that disrupts the children's concentration in each small group, and the short duration resulting from limited time for community service.

## **Discussion**

The information technology being developed today is beneficial to human life, as activities become easier, faster, and more efficient. Therefore, every individual is required to actively participate in accessing information technology (Rupilele, 2018). One of the main aspects of the modern era is the continuous advancement of technology, which will continue to evolve according to the needs and desires of humans, which never cease. A tangible form of technological advancement is the widespread availability of various gadgets, including laptops, computers, smartphones, televisions, radios, and games. (Novitasari, 2019).

Not only is the use of information technology beneficial in daily life, but it is also highly beneficial in the field of education. Advances in computer technology and information technology have had a profoundly positive impact on the world of education. One of the most influential aspects of computer technology and informatics in education is the use of computer networks and the Internet. With the advent of the internet, access to information for students is no longer limited by space, time, or distance. Through the internet, information can be presented as a learning resource that can be tailored to the individual learning pace of each student. Furthermore, learning media is not limited to text and images but can be combined with graphics, animations, videos, and audio simultaneously. This is known as multimedia, which provides a more interactive and engaging learning experience (Husaini, 2014). The learning process using technology can develop children's cognitive aspects in areas such as language, literacy, mathematics, science, digital literacy, and more.

The positive impact of advancements in information media and technology on children aged 5 to 12 is often referred to as the multi-tasking generation. The use of information media and technology offers several positive benefits, including facilitating the development of creativity and intelligence in children. Children no longer need to spend time and energy learning to read and write in books or on paper, as they can use their gadgets as more enjoyable learning tools. Children are more motivated to learn because the applications on their gadgets are usually equipped with engaging animations, bright colors, and cheerful songs. Additionally, children's imagination is better developed because the games they play are diverse and have various storylines (Nipriansyah *et al.*, 2021). On average, the number of children participating in learning with technology as a medium has a positive impact on cognitive, social, emotional, and physical aspects.

## **CONCLUSION**

Sooner or later, today's youth will face a world that is already familiar with various technological advancements. Moreover, by the time they reach adulthood, technology will be far more advanced than it is today. Therefore, they need to be introduced to the technology around them to build foundational skills for adapting to the changing times. Guidance for children in learning about technology is also necessary to ensure that their objectives remain focused and to prevent any carelessness that could lead to negative consequences. It is important to remember that the presence of technology, when used wisely and appropriately, can bring benefits and advancements in various fields, such as education.

## AUTHOR'S NOTE

The authors declare that there are no conflicts of interest related to the publication of this article. The authors affirm that the data and content of the article are free from plagiarism.

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