

## **PELATIHAN BERSERI TEKNOLOGI INFORMASI DAN KOMUNIKASI DI SEKOLAH DASAR MEKARSARI JAKARTA\***

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### **Abstrak**

Era industri 4.0 perlu mengenalkan teknologi informasi dan komunikasi (TIK) kepada masyarakat dimulai dari Sekolah Dasar (SD). Namun, SD Mekarsari tidak memiliki fasilitas ataupun kurikulum untuk mempersiapkan siswa untuk menghadapi era tersebut. Kegiatan pengabdian masyarakat ini bertujuan untuk mengenalkan anak-anak sejak dini dengan perangkat keras dan perangkat lunak komputer yang terkini. Peserta kegiatan pengabdian masyarakat ini terdiri dari siswa kelas 4 dan 5 SD yang didampingi oleh 2 guru di tiap kegiatan yang berlangsung. Materi kegiatan disusun dengan metode yang mudah dimengerti dengan kegiatan praktikum yang berhubungan dengan perkembangan TIK saat ini. Jenis kegiatan ini termasuk kedalam "direct philanthropic giving" dikarenakan bertujuan untuk memfasilitasi dan memberikan pengetahuan secara gratis kepada murid dan guru SD Mekarsari. Adapun luaran dari kegiatan ini adalah sebagai berikut: siswa dan guru mampu mengenali perangkat keras dan lunak dari komputer versi terkini; memahami cara untuk belajar pemrograman python; memahami cara untuk penganggaran harian dengan menggunakan Microsoft excel; mampu membuat cerita singkat dengan menggunakan Microsoft Word dan PowerPoint. Berdasarkan survey yang dilakukan, Seluruh siswa dapat memahami dan antusias dalam seluruh kegiatan pengabdian masyarakat yang diberikan. Kegiatan pengabdian masyarakat ini menyarankan bahwa setiap SD harus memiliki kurikulum dan laboratorium komputer untuk mempersiapkan para generasi muda untuk bersaing di era industri 4.0.

**Kata kunci:** TIK, anak-anak, perangkat keras dan lunak komputer, PKM, industri 4.0.

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## A WORKSHOP SERIES OF INFORMATION COMMUNICATION AND TECHNOLOGY AT MEKARSARI ELEMENTARY SCHOOL JAKARTA

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### **Abstract**

*Industry 4.0 era needs to introduce current information communication and technology (ICT) to the society starting from the elementary school. However, Mekarsari Elementary school does not have the facility nor curriculum to prepare the students to face the era. This corporate social responsibility (CSR) aimed to introduce the kids with the current development of hardware and software. The participants for the series of the workshop are the 15 4<sup>th</sup> and 5<sup>th</sup> grade students and two teachers from Mekarsari Elementary school. The intervention was devised by providing user-friendly teaching-learning materials with hands-on activities related to the current development of ICT. The type of study is the “direct philanthropic giving” because it aims at providing knowledge for free. As the result, the students are familiar with: the type of computer’s hardware and software; python programming; budgeting for their daily allowance using Microsoft Excel; and creating a short story and presentation in Microsoft Word and PowerPoint. Based on the survey, the students could comprehend and enthusiastic to complete the hands-on activities. This CSR suggests that each elementary school should have a curriculum and computer laboratory to prepare the youth to compete in industry 4.0 era.*

**Keywords:** *ICT, kids, hardware and software, CSR, industry 4.0.*

### **INTRODUCTION**

The development of technology is very fast in all of the sectors of life. Currently, the concept of industry 4.0 is already introduced by the German government (Rojko et al. 2017). It is stated that there will be a transformation of industrial manufacturing through digitalization and exploitation of potentials of new technologies. This fourth industrial revolution causes a reorganization of classical hierarchical automation systems to a self-organizing cyber-physical production system that allows flexible mass custom production and flexibility in production quantity. The benefit of industry 4.0 factory could result in a decrease in production costs by 10-30%, logistic costs by 10-30% and quality management costs by 10-20% (Rojko et al. 2017). Moreover, other advantages which can be achieved such as a shorter time to market for the new products, improved customer responsiveness, enabling a custom production without significantly increasing overall production costs, more flexible and friendlier working environment and more efficient use of natural resources and energy.

This transformation is very important for the position of a country in a global market. Therefore, some countries have put this concept into their roadmap. In North America, this concept has been brought up by the general electric company in late 2012 for a tight integration of physical and digital worlds that combines big data analytics with the Internet of Things (IoT) (Industrial Internet Consortium. 2015). In France, the concept of industry 4.0 was introduced as a core of the future French industrial policy (Presentation at the French embassy in Germany. 2015). Moreover, China also aims to comprehensively

upgrade Chinese industry by drawing direct inspiration from Germany's industry 4.0 concept and adapting it to the China needs (The state council of people's republic of china. 2016).

To face the industry 4.0 era, one of the key aspects is Information Communication and Technology (ICT). There will be a demand to introduce ICT to society. For example, starting from 2020, Singaporean government will make coding as a compulsory course that should be taught for grade 4-6 (Detik.com. 2019). However, In Indonesia ICT course is not a compulsory even some school does not have a facility such as lab computer nor Internet connection to implement ICT. In order to contribute to prepare the Indonesian human resource to face industry 4.0 therefore, this CSR project of bioinformatics department that funded by internal grant from LPPM department of Indonesia International Institute for Life Sciences (i3L) conducted a series of ICT workshop that teaches teachers and students from Mekarsari elementary school RW 11 Pulomas Barat Pulogadung Jakarta. The aim of this CSR activity is to introduce the concept of ICT with practical hands-on in each workshop.

ICT is in the scope of bioinformatics department because around 40% of the curriculum is related to the information technology courses as we adopted international curriculum of international society for computational biology (Welch et al. 2014). A total of four workshops have been conducted since we have a limited budget therefore, we only can conduct it in a short term period. The first workshop activities included history of the computer, type of computer, computer hardware, computer software to create email and learn about python programming. The second workshop activities discussed introducing PowerPoint (PPT) 2016 environment, create and save a new PPT, slide, slide content and presentation. The third workshop introduced about excel and the important component in excel. The fourth workshop discussed creating a new document, arranging fonts, creating the shape and text box, creating a table and writing a short story. The results of those workshop series showed that each student and teacher is capable to follow the material and hand-on in each workshop. All the materials are reproducible to be used at school in a module format.

## METHODS

There are some steps that need to be conducted in this CSR activities as shown in figure 1.

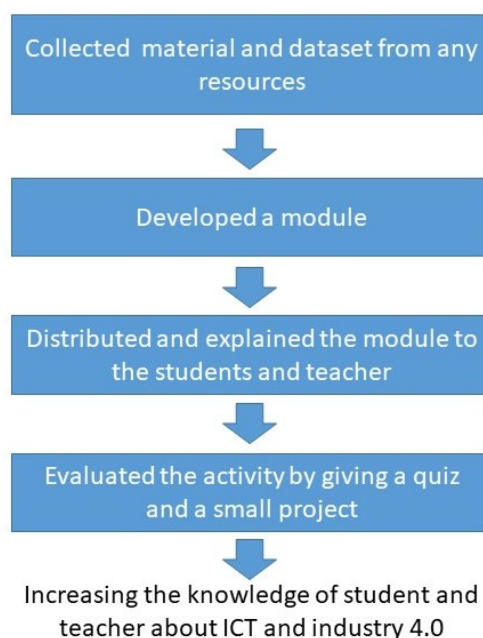


Figure 1. Flowchart CSR ICT at Mekarsari elementary school.

Each faculty from bioinformatics department at Indonesia International Institute for Life Sciences that involved in this CSR cooperated to conduct a workshop series to study ICT at Mekarsari elementary school RW 11 Pulomas Barat Pulogadung Jakarta. First, each faculty agreed that the content on this workshop included knowledge about the history about computer, type of computer, introduce about the hardware components of a PC, introduce the usage of application and software which is in here email and python programming respectively. Moreover, this CSR also introduced Microsoft office applications such as Microsoft Word, Microsoft Excel, and Microsoft powerpoint. Second, each faculty collected any related material from any resources. For example, for python programming we used a book that available online (Briggs et al. 2013); and for Microsoft office, we also used an available online book (Shin et al. 2002). Third, each faculty developed a module. Forth, each faculty distributed and explained the module to the students and teacher. We invited a total 15 students and 2 teachers to join each workshop at i3L computer lab 406 as shown in figure 2. Each workshop is performed in a day from morning to afternoon around 6 hours, 8:00 AM to 14.00 PM or based on the availability of the faculty time. And fourth, each faculty evaluated the CSR activity through the quiz and small project given to the students.



Figure 2. Activities of the workshop series at i3L computer lab room 406

## RESULTS AND DISCUSSIONS

There are four modules developed in this CSR. First, module 1 consists of history and type of computer, operating system, computer hardware, email, and python programming. The objective of this module is students will understand about: the overview of computer type, how it works and the evolution of computer, the different of operating system, the components of computer hardware, how to create and use an email and how to do coding in python programming. For the evaluation, each session will have a practice and quiz. For example, after giving a material about computer hardware as shown in figure 3, there will be a quiz to guess the picture of computer hardware, guess the name of it and practice to plug in and unplug the computer hardware. Moreover, we tested the student with coding. The selected programming language is python programming. The basic programming has been taught. The aim of this coding session is to let the student understand the environment of the python software, how to start coding, how to run, how to interpret the coding. And also, we teach the student how learn a programming language both using installed software such as IDLE and using interactive websites such as datacamp, codewar and etc. Python is selected for this CSR activity since many applications are used

python to developed an automation system (Pavithra et al. 2015). Some of pictures from the material can be seen in figure 4.



Figure 3. A workshop material about computer hardware

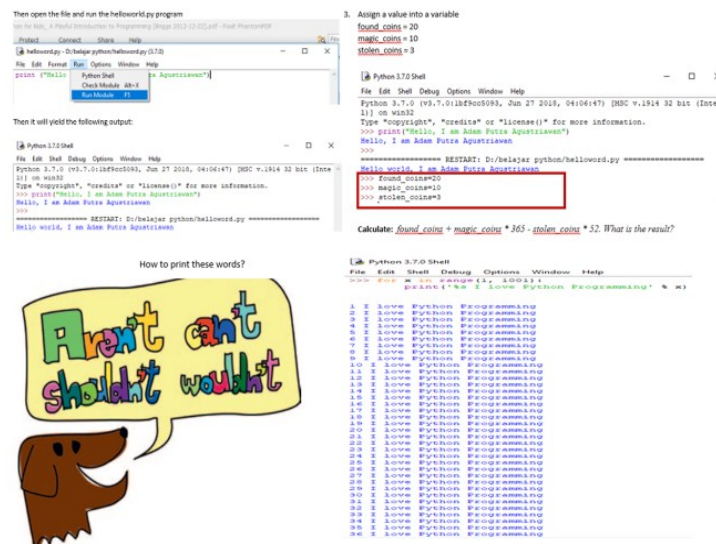


Figure 4. A workshop material about python programming

This module 1 is a major skill for human resources to face industry 4.0. we need to introduce ICT since the beginning at school, therefore, each student will be familiar with the concept of industry 4.0 since the beginning. In industry 4.0 there will be an internet of thing (IoT) era where almost every system will consist of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction (lee et al. 2015). Therefore, to make it happens and to be competitive we must teach our young generation about ICT. Therefore, we can prepare human resource to have the ability to be competitive in industry 4.0 era.

Second to the fourth module will discuss a basic need that society needs to understand which is to use Microsoft offices such as Microsoft Word, Microsoft Excel, and Microsoft PowerPoint. Therefore, we

developed module to be used as a hand-on for the teacher and student at elementary school level. Some pictures related to the Microsoft office module can be seen in figure 5.

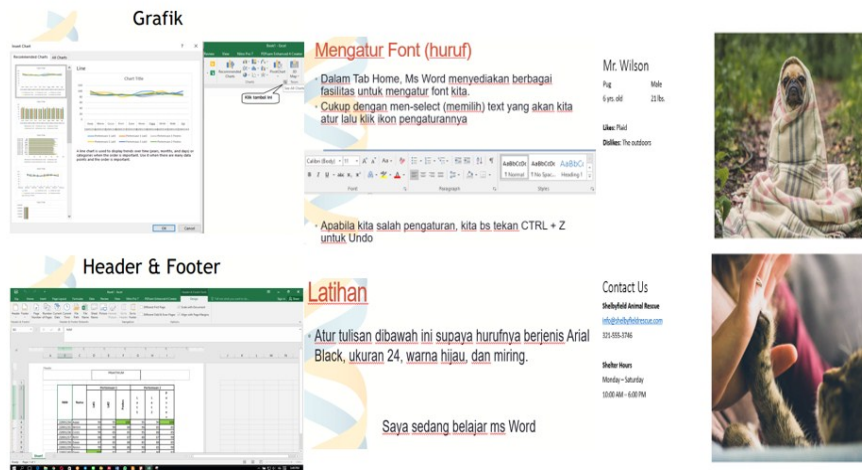


Figure 5. A workshop material about Microsoft office

## CONCLUSIONS

This CSR activity is a contribution from our department to the society and the developed module can be used as a hand-on for the student and teacher grade 4-6 elementary school to study ICT. However, we found that even in a capital city Jakarta, not every school have computer lab included Mekarsari elementary school so it will become a limitation for students to know comprehensively a basic need in ICT since the beginning.

From the problem above, taken together, we need to prepare this following thing: first, a facility such as a lab computer, internet connection should be provided in each school start from elementary school. Second, each school should have an ICT teacher and third there should be many books related to ICT start from the elementary school. And the last, ICT should become a compulsory course that should be taken by the students. When each school and our education system can provide those following things, we believe that we can create a competitive human resource to face industry 4.0 era.

To give a comprehensive workshop or training on a big scale we need more funding. And our strategy to follow up this CSR activity is to apply government funding and focus to slightly change our target participant which is from student become only a teacher in more big scale of schools.

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