THE 4CS LEARNING MODEL
IN TEACHER PROFESSIONAL DEVELOPMENT PROGRAM

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ABSTRACT

The research aimed to analyze the effectiveness of 4Cs models (communication, collaboration, critical thinking and problem-solving, as well as creativity and innovation) to improve teachers' performance in the 21st-century era. The development of technology in the era, especially in the way of learning of students, was responded to lately by schools and teachers. Using a qualitative case study, the research analyzed the school's professional development program using the 4Cs model. The research result shows that the model of 4Cs gives enthusiasm, and a deep impression on teachers in their classroom activities accelerates the competences of teachers in using technology. Besides, it shows the level of importance of the model: communication, then creativity, collaboration, and critical thinking. The research has limitations in assessing the performance of students who are taught by trained teachers. So, further research is proposed to analyze the performance of students regarding the 4Cs competences.

Keywords: 4Cs learning model, professional teacher, professional development program

INTRODUCTION

Technology allows people to get information more accessible and faster. Industrial Revolution 4.0 sends a message about the domination of information technology in many sectors. Even technology can take over the human being's role through artificial intelligence (Hussin, 2018). The rapid development of information technology can give a significant impact on the education sector, especially in the delivery of knowledge to the students who are changed by the growth of technology. However, schools do not match phenomena related to the rapid development of technology in preparing students to use technology in their classrooms. The school's unpreparedness will result in students becoming uncritical and fixated on old-style learning methods that are ineffective. It becomes a big problem because technology has become a part of the lives of today's students.

Regarding technology development, Prensky (2001) has already divided humans into two types. The first type is the digital native that refers to people around 10-29 years old. They are commonly called 'Generation Y'. Prensky (2001) has described that they no longer need to learn how to use the internet, and the website is on their bones. The second type is digital immigrants that they are around 30-60 years old (Prensky, 2001). Kaufman (2011) has mentioned another classification as a digital alien. They are about 45 years old and older (Doringin, 2019). Prensky (2001) and Kaufman (2011) only want to explain that the current generation is technology-friendly and multi-tasking, making them more creative.

Levenburg and Howard (1998) have explained the explosion of technological growth in many aspects of human life. This allows schools to update methods and facilities and have broad access to education. Technology also helps students understand lessons better through verbal, visual, and audio tools. Technology supports higher-order thinking skills (Horn & Fisher, 2017). The relevance of the technology growth in education becomes the main topic of the Partnership for 21st-century skills (P21) meeting. The meeting, which is a meeting at the level of the United

States Congress in January 2016, confirms that there are four competencies needed by educators to be ready in facing the 21ˢᵗ-century era (P21.org, 2018). This model is then adopted by schools and professional training programs throughout the United States.

The partners who formulated this concept in education consist of the National Education Association (NEA), the United States Department of Education, AOL Time Warner Foundation, Apple Computer, Inc., Cable in the Classroom, Cisco Systems, Inc., Dell Computer Corporation, Microsoft Corporation, SAP, Ken Kay (President and Co-Founder), Dins Golder-Dardis, and several other companies. This group gathers and discusses what competencies a nation must prepare to win the world competition. The focal point of discussion is the competencies developed in the world of education, especially for K-12 or compulsory age of study (P21.org, 2018).

Alismail and McGuire (2015) have said that the P21 framework integrates core academic knowledge, critical thinking, and skills of social aspects in teaching and learning. It helps students master the abilities that are required in the 21st-century. These multi-dimensional skills can support students to succeed in the future. Alismail and McGuire (2015) have stressed that the P21 framework is implemented in education that could make an instructional shift to ensure students succeed as the innovators of the future. This framework can be seen in Figure 1.

The research focuses on the teaching and learning process using the 4Cs method for teachers in the Professional Development (PD) program. The teachers are ready to teach using the 4Cs method for each student in the future. The professional development learning process itself will provide mapping, training, exercises, and recommendations for teachers who take part in this program. It can be seen in Figure 2.

Nowadays, students need critical thinking skills and problem-solving not only to answer their current assignments but to the uncertainty of challenges that will be present when they are adults. The American Management Association survey states that the 4Cs model will be the most important in the organizations' future. As many as 75,5% of company leaders are asked by the survey that the capabilities and competencies of 4Cs will be increasingly important in the next three to five years, especially in companies entering the global competition. The concept of 4Cs is explained (P21. org, 2018; Doringin, 2019).

The first skill of the 4Cs is the creativity that explains how a teacher cannot only rely on material books but utilize technology such as devices so that they become more creative and are not covered by administrative work. Freedom to fail and create a healthy environment is an essential point in increasing creativity. The second is the critical thinking that explains how is the process of thinking as a reflection, analysis, and evaluation, in solving a problem. With critical thinking, the teacher will always be challenged so that he/she is not satisfied with one answer but can improve his/her analytical skills to become the best solution. The third is the collaboration; a key success of change is collaborative engagement (Cleveland-Innes, Emes, & Ellard, 2001). If the collaborative process is no longer sufficient, teachers must be able to actively collaborate with their respective abilities to create an integrated solution to become more leverage and stronger. Students will learn this future as part of work in daily life. Furthermore, the last is communication that is a basic competency in the form of oral, verbal, body language, listening knowledge, and technology. This knowledge becomes the basic knowledge of how every human being can communicate well with each
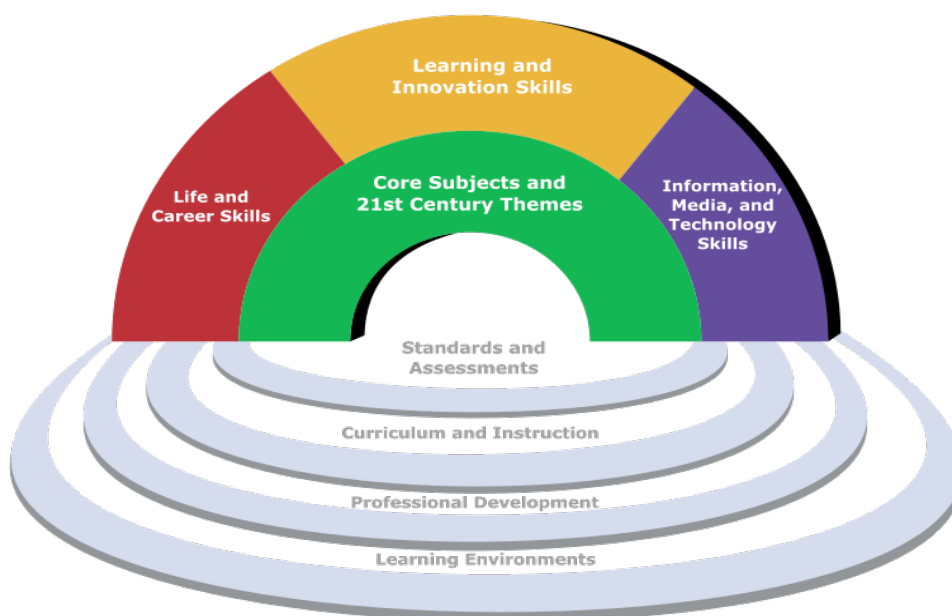

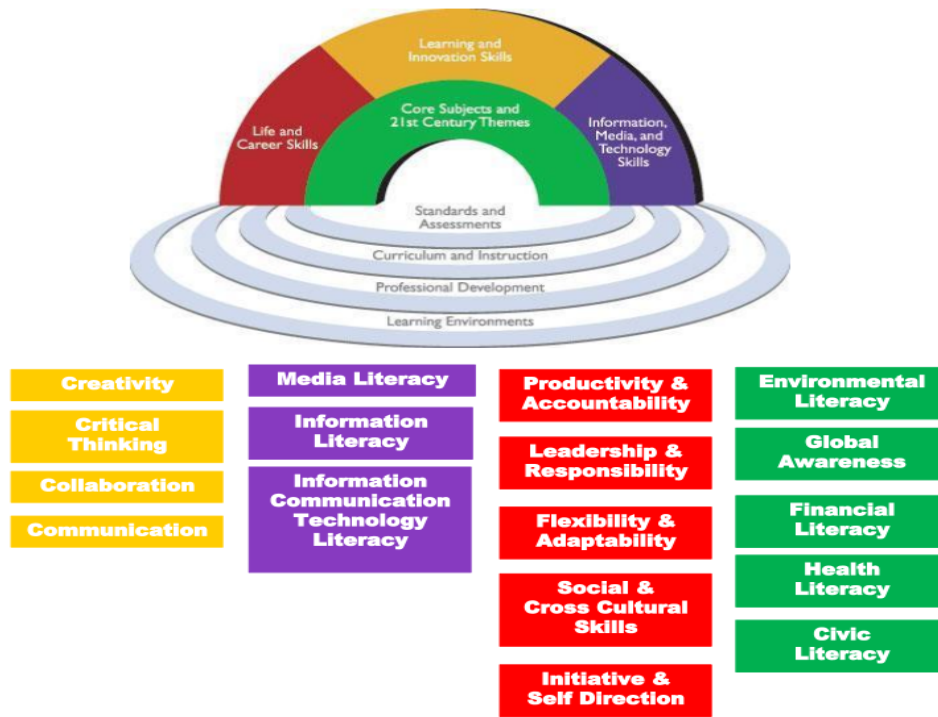Figure 1 Framework for 21ˢᵗ-Century Learning

Figure 2 The 4Cs of 21st-Century Learning

other as a social creature.

Technology and the expertise of 21st-century skills become the essential aspects of guiding students to explore, build on, and find meaningful ideas and concepts in learning. It is important to introduce technology and 21st-century skills to students as early as possible (Horn & Fisher, 2017; Karim et al., 2019). This technology will support schools and teachers to do personalized learning. It will also hamper the tendency to do one-size-fits-all that does not respect students' uniqueness. Personalized learning will be developed through various styles in teaching and learning activities. Multiple models can meet the needs and trends of students (Doringin, 2019).

Although technology is a major issue for school development, schools must consider others, namely pedagogy and content. Doering et al. (2009) have said that technology must be supported by pedagogy. Pedagogy is a method and approach to teaching and knowledge of how learning takes place. Good pedagogy is needed because students have a variety of backgrounds with different learning styles and needs. Park (2011) has said that the key to achieving good content design is to produce two aspects, namely active participation and student involvement. Active participation is related to efforts to encourage teachers to know how to design good content. Engagement deals with how to make good and complete content.

Mishra and Koehler (2008) have developed learning that considers aspects of technology balanced with aspects of pedagogy and content. They have released what is called TPACK (Technology, Pedagogy, and Content Knowledge). TPACK answers

the needs of this technological age, without leaving basic education related to pedagogy and content. TPAK accommodates three things, namely content, pedagogy, and technology. The TPACK concept attracts the attention of things done or carried out together and not alone (Rafi & Sabrina, 2019; Sugiyarti, Arif, & Mursalin, 2018).

Teacher quality is a key factor that must be improved in the education sector. It is because many educational problems are related to the HR function or teacher function, such as teacher motivation, teacher skills, and teacher distribution (Doringin & Sasmoko, 2017). Continuous Professional Development (PKB) for teachers carried out by the government has not answered Indonesia's needs for optimal teaching and learning outcomes. It proves that Indonesia is still far behind other countries when it sees the results of international tests (OECD, 2016). The Organization for Economic Cooperation and Development (OECD) has surveyed 72 countries using a test called the Program for International Student Assessment (PISA) and has reported that Indonesia ranks 62nd in 2015, up from 71 in 2013 (P21.org., 2018). Indonesia's ranking is still low and behind other Southeast Asian countries, including Vietnam and Malaysia (P21.org., 2018).

The research discusses problems for the students of this age who are very technology literate. However, they also need to be equipped with strong pedagogy and content to achieve the human profile inherent in the 21st-century, namely the 4C profile; communication, collaboration, critical thinking and problem-solving, as well as creativity and innovation. From this background, the problem to be raised is

teachers' readiness to use technology that can achieve the 4C profile. This teacher readiness check will use the TPACK concept agreement. Based on the problems agreed, the purpose of the research is to discuss how to develop professionalism that is supported by technology using the 4Cs method as a reference to study students' abilities for the future.

METHODS

The research applies a qualitative case study that is still relatively new for the 4Cs model. The qualitative research model is not based on the amount of data but instead looks for meaning in the data. Researchers function as data collection tools so that their existence is inseparable from what is studied. The research analyzes a case in a school that conducted a teacher professional development that runs for one year (January-November 2019). The research sample is the 20 school teachers who taught in various fields of study and teaching levels. The process carried out is that teachers are trained to improve their teaching using the 4Cs model. Every month they will receive information about material enrichment. At the end of the program, their progress will be evaluated using the method of supervising the action of seeing the teachers' teaching and learning process.

The data collection process is carried out face-to-face with physical and online media because it has been arranged in a teacher professional development program that is previously informed. The actors asked for interviews are optional because of various considerations, such as the most active teachers in carrying out the mentoring process. The process of data analysis in the research uses the method of data triangulation that compares data from a variety of different sources, one of which is field data compared with data from the Principal. In terms of implementation, the teacher professional development program is a comprehensive program consisting of a series of learning to teachers using technology in the teaching and learning process. At present, the program only teaches technically how technology can be used in everyday learning examples.

The process of teacher professional development programs uses the TPACK framework that can be seen in Figure 3. TPACK can be proven to help teachers in combining pedagogy, content, and technology in one class learning process.
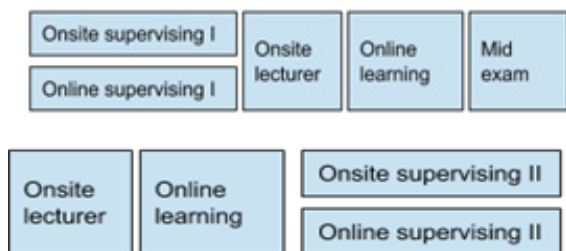

Figure 3 Teacher Professional Development Program

When the implementation process is in the form of classroom management for students, TPACK does not discuss the activity, saying that the teacher assistance program's success consists of how to teach and assess students using the 4Cs method. It is indicated to be the first choice and is the key to the success of future learning initiative programs. Therefore, a suitable new model is a 4Cs model that is compatible with 21st-century learning. The observation process is carried out in two stages, namely onsite and online. At the onsite, that is, in a face-to-face meeting in the form of training and supervision. The onsite process takes place at the Putera Harapan school, Purwokerto, for three days. This process occurs twice, namely at the beginning of the program and at the end of the program. The online observation process is carried out using the Learning Management System (LMS) and the group chat application media. This process takes up to 9-10 months. Figure 4 is an example image of using LMS in this program.
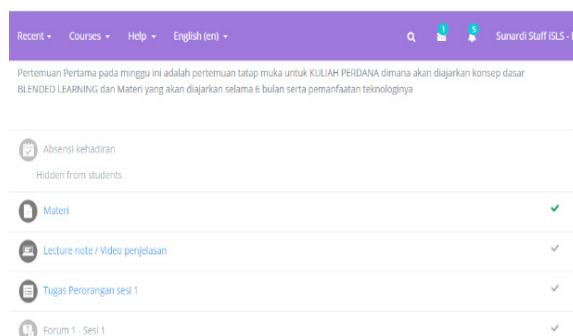

Figure 4 The Example of the Online Learning Topic

The object of observation is the change in the way teachers teach from traditional to collaborative teaching. Besides teachers, technology is also used in teaching and learning in terms of advantages and disadvantages. The interview process is carried out thoroughly for all 20 members of the program and program leaders. The interviews are conducted formally in the form of one-on-one meetings and informally in the form of training.

Figure 5 The Example of Interview and Training for Teachers

Specifically, for certain participants, more in-depth interviews are conducted regarding the implementation of the 4Cs model in their teaching process. In addition to participants, the Principal and school management are included in non-formal interviews to obtain more accurate data. The school management team is also used as a triangular data analysis so that the data becomes more valid and measurable. The form of online communication in this program becomes important because of the limitations of time and place (long-distance program). Figure 5 shows an example of interviews and training for teachers.

RESULTS AND DISCUSSIONS

Some conclusions are drawn based on the collected data. First, the 4Cs method, which is still relatively new for teachers who take the professional teacher program, gives a deep impression and enthusiasm in increasing understanding in the use of learning technology. Second, from the research, it can be seen that the application of the 4Cs method for teacher development programs is beneficial for accelerating the ability of teachers to understand the technology and its use in teaching and learning. Third, sequentially the most important of the 4Cs model is communication, then creativity, collaboration, and critical thinking.

The following are the outputs collected in the 4Cs model criteria sorted into the most important parts. The researcher will explain them one by one to give more information about the strongest to the lowest aspects. He explains points by points and relate them with the consequences for the students and the education environment. The first skill is communication skills. Surveying the ten skills needed by students, it turns out that communication is the skill most needed by students beyond the others, including mathematics or natural knowledge (Changwong, Sukkamart, & Sisan, 2018; Wahyuni, Masih, & Mei Rejeki, 2018).

The data results are based on several interviews and observations of elementary, middle, and high school teachers. It appears that teachers do not provide space and opportunities for students to give ideas, data, work, and answer questions in public. This becomes very important to provide more in-depth information on how students can communicate well in public based on the built system or school situation (Wahyuni, Masih, & Mei Rejeki 2018). Compared to other 4Cs models, communication in research seems to be very poorly applied to students. This will be an important finding that can be used as one of the important recommendations. Every school must be able to provide an intervention in the curriculum that does not allow students to present their work. There are some techniques that can be used or recommended to solve the problem. The teacher must give the final project in the form of presentations and work because it will improve students' communication skills very rapidly (Wahyuni, Masih, & Mei Rejeki, 2018).

The second skill is creativity. The researcher cannot provide an empirical understanding of creativity. Creativity is the interaction between intelligence, process, and environment in which an individual or group produces clear products that are both new and useful as in social contexts. In the research, creativity is part of the 4Cs model, which occupies the third position with more attention from the teacher. Creativity must become the main characteristic of 21st-century skills, and students must develop it as the implementation of higher-order thinking skills (Changwong, Sukkamart, & Sisan, 2018). The inability to engage students in mapping concepts or brainstorming, challenging with new ideas, testing ideas, and creating new solutions is the part that needs attention. A long time in one subject matter is one of the recommendations so that students have room to imagine, put out ideas, test ideas, and tell thoughts without limits. Creativity relates to the expression or performance of students. They can express their creativity in some projects, performances, or products (Wani & Mehraj, 2014).

The third skill is a collaboration. In terms of collaboration, Zafirov (2013) has mentioned that the nature of collaboration at this time has shifted to a more sophisticated expertise. In addition to face-to-face collaboration with coworkers or students, 21st-century workers are increasingly utilizing deeper collaboration technology media to friends in other parts of the world. Collaboration becomes a part that the teachers already understand how important this section to the future of students. There are many opportunities to implement collaboration in the life of students. The collaboration also relates to the mindset because it is too long that the students have the concept that they have to compete with each other. The partnership will have more impact on the products and the character (Zafirov, 2013). Of course, this can be enhanced by the teacher professional development program that is being implemented. Recommendations can be provided, namely (a) can show the ability to work effectively and respect diverse teams; (b) practice flexibility and willingness to help and compromise to achieve common goals; (c) assuming joint responsibility; and (d) assessing the contribution of individuals made.

The fourth skill is critical thinking that relates to curiosity. It allows people to have imagination and push them to ask many questions. Critical thinking is considered the lamp of life to avoid negative issues and wrong information (Changwong, Sukkamart, & Sisan, 2018). Critical thinking can have a dual process. The first is impulsive, reactionary, and emotive thoughts, such as prejudice. The second is intentional, reflective, and logical thinking, which will conceptualize as more critical thinking. Other researchers have also theorized thinking as a dual-process model, and this theory has become popular among many social and cognitive psychologists.

Apart from existing theories, teachers have understood and taught students to understand information such as incorrect information better,

make their conclusions about events, analyze and defend their opinions, and argue persuasive based on supporting evidence. Specifically, for primary schools, critical thinking skills must be an integral part of education. In contrast, for secondary schools and senior high schools, instruction on various aspects and application of critical thinking must be integrated into cross-curriculum instruction if special subjects are needed in terms of thinking critically.

Because the research model is still new and requires greater data, the researcher hopes to have the opportunity to obtain teacher data nationally and to expand from several levels of education. It is important to see a significant comparison between teaching patterns using the 4Cs model with other traditional models. Furthermore, in the teacher professional development program, this method can be used in conjunction with the TPACK framework as a foundation for teaching using technology. This is very important if the teaching of technology is not followed by the process of teaching methods required by the industrial world, so students will not feel challenged to improve their knowledge and skills. Surely it will result in students feeling dissatisfied, and performance will decrease.

For the teacher, the professional development program itself must be taken seriously and dare to invest so that teachers can adapt to the development of new learning and improve new ways of teaching (Doringin & Sasmoko, 2017). As a suggestion in the future, the use of the 4Cs model can be integrated with the Learning Implementation Plan (RPP) or the school syllabus. Access to these models can be implemented using digital learning portals such as Learning Management Systems (LMS) that enable students to learn more flexibly.

CONCLUSIONS

The research shows the problem or teachers' readiness for using technology. It becomes important because technology has become part of the life of students nowadays. The research aims to analyze the effectiveness of 4Cs models (communication, collaboration, critical thinking and problem solving, and creativity and innovation) in Professional Development Programs in a school. Using a qualitative case study, the research has the result that the model of 4Cs gives enthusiasm and a deep impression on teachers in their classroom activities. The model of 4Cs also accelerates the competences of teachers in using technology. The model also shows the level of importance of the elements communication, then creativity, collaboration, and critical thinking.

Of course, there are limitations in doing the research where the development of ongoing teacher training does not directly assess students. Hope in future research, there will be an evaluation of training methods for teacher development and evaluation of applying the 4Cs method to students of teachers who

are trained. There are also limitations of place and time that make the research uses the interview method and rarely use the observation. Further research is needed to check the relationship of the 4Cs model with the TPACK model in checking students' performance. It gives the message that technology focuses not only on the 21st-century teaching-learning activities but also on content and pedagogy.

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