Education 4.0 and the 21ˢᵗ Century Skills: A Case Study of Smartphone Use in English Classes

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Abstract— One of the most researched topics in education 4.0 is the learning process which is dramatically different from traditional approaches. Since the learners and teachers are suggested to acquire the 21ˢᵗ century skills, robotic utilizations are needed. This paper discusses the usage of smartphone for students in university bring different circumstance in teaching learning process. Besides, this paper expects to determine how smartphone affects the product of students' achievement and indirectly identify the rationale how it changes the students' and the teachers' ways of thinking. This study was conducted qualitatively as a case study conducted to the postgraduate students of English Department, Mataram University. The data were collected by using observation and interviews. The observation data were analyzed with descriptive procedure identifying how teachers and students used smartphone and how these usages were related with the 21ˢᵗ century skills. These data were enriched with the interview data where the samples, firstly, recounted on the procedures how they have used their personal smartphones as learning instruments, secondly, evaluated how private learning experiences with the personal smartphone have equipped them with the 21ˢᵗ century skills, and, thirdly, explicates the nature of the relevant 21ˢᵗ century skills that they have referred to. The result of this research indicates that one hundred percent of the students have smartphones with 4G signal and almost all class activities use of internet access. The processes of finding materials, making teacher-student appointments, drafting, re-drafting, and submitting assignments were facilitated through smartphones. Such a use of telecommunication devices has indirectly trained students with not only IT-related skills but also critical thinking and problem solving, collaboration, communication, creativity and innovative skills as core skills relevant with the 21ˢᵗ century.

Keywords— *education 4.0, 21ˢᵗ Century skills, case study, smartphone*

I. INTRODUCTION

The development of education in the world cannot be separated from the development of the industrial revolution because indirectly it changes the system of economy which affect the educational system. The industrial revolution was began from industrial revolution of 1.0 occurred in the 18th century through the invention of the steam engine, it allowed goods to be mass produced. Industrial revolution of 2.0 occurred in the 19-20th century through electricity usage which made production costs become cheaper. The industrial revolution 3.0 occurred around the 1970s through the use of computer. And now we are in the industrial revolution 4.0. It occurred around the 2010s through engineering intelligence and internet of things as the core of the movement and connectivity of humans and machines [1].

The term 4.0 was originally initiated by the German government to promote computerization manufacturing in implementation of digital economy. In this era, fundamental changes occur because of massive changes in society in the field of technology used in every aspect of society. In this era, technology of information has become the basis in human life, including education in Indonesia. In the Era of 4.0 several things happened without limit and this occur through the use of internet and digital technology as a supporting device in connectivity between humans and machines [2].

In the last decade, the system of education in Indonesia has extremely improved. It can be seen within which the government has made several attempts to increase the quality of national education as the implementation of education 4.0. The government has introduced ICT usage in classrooms and national exams in a bid to bring technology into the education space. Nonetheless, this practice remains limited to a cluster of schools. This is a new challenge to redefine the new Education 4.0, to identify the intelligent people, who are creative and innovative. Since it has become the digital society, it creates changes in the lifestyle of distance, time and places. It connects globally all people in the world with wider vision and keeps updating faster. The development of media technology majoring almost all the activity today including education. This will make our perspective of life will change into more addicted to the machinery with more advancement both in its function and programs [3].

With the demands of rapid development, we have to be aware that education should make necessary adaptation to technological advancement. Various kinds of technology have been applied in the process of learning. Before, the teacher should teach by conservative method like explaining by detail and take a note in the book about all the teacher's explanations. But now, the use of technology development such as computer, LCD projector, and internet access has made the process of learning more effective and efficient.

To participate in the Industrial revolution 4.0, government start to change the focus from building the infrastructure to building human resources development to face education 4.0. Education 4.0 is a common term used by scientist to define many ways in integrating cyber technology into teaching learning process. It is because the sophisticated technology development can affect the way we think and act in our daily life.

Education in this era as a Mass Production means those who graduated will have the same qualification [3]. It is like industrial plant who define the students is like a product, the

curriculum as the product, the exam as a control of quality, certificate or the diploma is like a guarantee paper and the educational institution is like a brand of a product.

Entering the education 4.0, we should consider the most popular learning strategies in today's environment. The skill nowadays is famous by name the four C's of 21st Century skills. The four C's are critical thinking and problem solving, communication, collaboration and creativity and innovation [4]. Critical thinking as the intellectually disciplined process of actively and skilfully conceptualizing, applying, analysing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experiencing, reflection, reasoning, or communication as a guide to belief and action [5]. Critical thinking skills are considered as an important skill which enable students to deal directly to social and scientific to applying the ability for problem solving [6]. Meanwhile communication skill is very useful to mastered because communication is essentially about the transfer of information between people. Communication can be viewed as a professional practice where appropriate rules and tools can be applied in order to enhance the utility of the information communicated as a social processes [7].

Collaborative skills are the behaviours that help two or more people work together and function well in the process of collaborations. Collaborative skill like playing on a soccer team, for instance [8]. Continual communication is critical to the team's success, requiring frequent collaboration between team members to deliver a winning solution or service. In addition, Creativity and innovation are becoming increasingly important for the development of the 21st century skill. It demands a creative learning and innovative teaching [9].

They conceptualized the creative and innovative skill as a skill for all and it is argued that educational actors have the power to unlock the creative and innovative potential of the young. It means that students should be creative to develop their knowledge and teacher as the mentor should be able to find innovative ways to increase students comprehension in class. As the example, Ruang Guru is an application reflects the creative and innovative skill applied in the digital era. And this application becomes a new trend in education.

Learning management of this era is a new learning system [10]. Different from the traditional method we usually used in the past, the new learning system allows the students to grow with knowledge and skills for the whole life, not just to know how to read and write but to be able to live in a society and to be equipped with the best of his/her ability. Therefore, Education 4.0 will be more than just an education. Only by implementing those skills, learners are counted to be able to compete in education 4.0.

Due to the importance of mastering the four skills to face education 4.0, the use of smartphone can be considered as a device to optimize teaching learning process in class. Smartphone is a mobile phone with multipurpose utilization and advanced features like social media, GPS, data transfer, entertainment, browsing and making many kinds of transaction.

Smartphone use now becomes ubiquitous. Almost all people including students today cannot be separated from their smartphone. It is also used to helping them to prepare for their future by enriching their learning process, it can make learning process go easy as the student can search helpful content and material by themselves so they can learn anytime and everywhere they want.

II. METHOD

This research is about case study. A case study is a research strategy and an empirical inquiry that investigates a phenomenon within its real-life context. The focus of this research is on the use of smartphone as the device to enrich students activity in teaching learning process to face the era of education 4.0 by considering four skills as the 21st century skills.

This study was conducted qualitatively because it is primarily exploratory research where the subject of this research are chosen by observing every single class which benefitting the smartphone uses in their teaching learning process. From the observation, the subjects will be conducted to the postgraduate students of English Department, Mataram University. This is because all students in that class have their personal smartphone that they use in every single activity they do in the teaching learning process.

In this study, the data have been collected by using observation and interview. Observation is a kind of measuring the data which not only measure the correspondence action but also it can record the phenomenon happened like situation and condition. This technique is used to research the human behaviors, process implementation of a technique, and used to measure the small group of correspondence. In observation, the researcher is involved in the situation as a resource data. In addition, interview is done by giving questions to correspondence in face to face to gain an accurate data [11]. The observation data were analyzed with descriptive procedure identifying how teachers and students used smartphone and how these usages were related with the 21st century skills.

These data were conducted with the interview data because in qualitative research, the result of interview can be used as the strongest source to get the information. The interview were done by firstly, recounted on the procedures how they have used their personal smartphones as learning instruments, secondly, evaluated how private learning experiences with the personal smartphone have equipped them with the 21st century skills, and, thirdly, explicates the nature of the relevant 21st century skills that they have referred to.

Thus, the current study aimed at examining the impact of using advance technology like smartphone can considered as an alternative way to enrich student's comprehension and its potency to create an effective and innovative learning.

III. RESULTS AND DISCUSSION

Based on the interview and observation conducted to postgraduate students of English department, it founded that all students have their own smartphone. The smartphone they have is smartphone with fast internet access which called 4G signal. The benefit of its 4G signals facilitate them with tremendous access to every site they want as long as the connection to the internet is on.

The internet connection is very important according to the students who has been interviewed, they need a good

connection to work out the learning subject. The result of interview showing that the process of discussion can be done between students and students or students and teacher although the time for its subject finished. It is because today we deal with new applications called WhatsApp. WhatsApp is a fascinating application which can connect us to the society and the whole world. This is a medium of making communication easier and faster thereby by enhancing effective flow of information, idea sharing and connecting people easier [12]. WhatsApp as a popular mobile application that providing instant messaging service in smartphones and it uses Internet services to communicate different type of text and multimedia messages between users or groups. The effect of WhatsApp on our lives, culture, and society keeps on increasing [13].

According to students interviewed, it founded that there are a number of advantages of WhatsApp based on students' point of view. Some of which are first, WhatsApp is completely free to use for sending message, file, picture or video to anywhere in the world as long as we have a quota internet. Second, voice call and video calling are available. Third, it imports the contacts from our phone and tells us that how many of our friends are using WhatsApp. Fourth, WhatsApp started providing end-to-end encryption feature, which makes their WhatsApp communication highly secure. It can be applied only by smartphone with minimal 4G signal.

In relation to the assistance of WhatsApp application, students can utilizing it as a media of discussion and sharing knowledge not only with their friends but also their teacher or their senior and make a good feedback for them to increase their comprehension and their knowledge to fill their dead -time, keep in touch with their social network when lonely, and act as their continuous companion [14]. One student said that by WhatsApp they can submitting their assignment to teacher and no need to print it out like we usually do. But, if the file size of their assignment is more than capacity of WhatsApp, they have to send it by e-mail and it of course can be done in smartphone. It is because, many kinds of sending application is covered by the devise called smartphone. The more sophisticated the phone, the more application available.

Besides, the result of the interview and observations showing that smartphone can be used as a media to finds materials directly just by click the key words of information they want. Of course, it provides them with easy learning because they do not need to wait for teachers explaining the concept of something but they can find learning materials by surfing in the internet by themselves with amazing acceleration access. Finding books is also available using smartphone, it provides them to collect as many as books they want. It provides them to get large numbers of references as their materials in learning process. Smartphone provides access to wide range of resources in various contents, it helps develop the mindset and behavior in problematic thoughts [14].

It shows that, in observation, the teaching learning process eventually be more active and passionate since smartphone becomes part of their learning device. It can be seen in class, while teacher explaining the materials, students are allowed to record and shoot the explanation by their phone so they can replay it later. It will be extremely beneficial for them to comprehend the concept in detail then will be saved in their memory card and they can watch it again. They also capture the slide show of their teacher's presentation, so they do not need to write in a hurry as we usually did in the past few years.

Based on the result of interviews and observations, it can be concluded that the use of smartphone is precisely beneficial for both teacher and students. Of course, the efficiency of this device will be more valuable if in its implementation, the students apply the four C's skills like critical thinking and problem solving, communication, collaborations, and creativity and innovation.

The critical thinking skill and problem solving can be seen when teacher requests the students to presenting some materials and ask them to find the source by themselves, the students should think critically to find the solutions of their teacher's command. They will try to find that source both offline and online ways, and online ways can be done by searching in the internet by their smartphones. They will select and collect all the data related to their assignment. In this case, they should be able to think critically to find the appropriate materials and source books. It can consider as the problem-solving skill that the student should be possessed.

Communication skill is very important for the students because they must know how to express their feeling appropriately and effectively when they are talking to their teacher or their friends. If they do not have the communication skill, they will get trouble in their life. It founded that, when students want to make an appointment to their teacher both directly or indirectly, they have to use formal language in order to make it polite. The communication skill also needed in presentation in class because without good communication, the presentations aim will not be achieved.

As a means of collaborations skill which enables student to work together in class and share information to achieve the deal, today this can be done not only in class but also indirectly in social media. The students can collaborate and make a discussion through application called WhatsApp. They also can invite their teacher to join in the forum. As the result, both teacher and students can collaborate and work together to make the process of teaching learning more comprehending.

In addition, creativity and innovation is considered as a very important skill to be developed in this era. Creativity is the beginning of Innovation because a creative idea can start a changing. Before becoming innovation, creativity is only the form of ideas that are triggered, without a clear application, when it was applied, that's why there was Innovation [15]. In this case, teacher should be able to create a new innovation in finding new method and technique applying in teaching learning process by implementing advance technology like smartphone. Not only teacher, but also students are encouraged to be a creative and innovative graduation as a qualified human resource.

All those skills are very useful to face education 4.0, as the demand of this era, teacher and students must be able to compete by applying modern ways and robotic device to

enhance their knowledge. By this study, it shows that the use of smartphone is an effective way to develop those four C's skills to answer the challenge of education 4.0 in the industrial revolution 4.0.

Obviously, the effectiveness of using additional devices like smartphone can give a number of benefits for both teacher and students in class. But grievously in the result of interview, it showed that the advance technology like smartphone also brings the negative effect to them. Because a half of the correspondence of this study is students in the age of 30's, they complained about their health. The use of smartphone frequently makes them got headache and affect their sleep pattern. In addition, more than a half of them admitted that they cannot be separated from their phone because almost all of their activity related to smartphone assistances. They seem like a patient who addicted to drug but here the drug could be a technological addiction. Moreover, it depends on us on how to use the smartphone in an appropriate way, so we can avoid some negative effect of using technology like smartphone.

Regarding with the effectiveness of smartphone in class, the institutions should be aware of the need of student requirement. The institution, in this case, should provide the internet access which are free for everyone in the school. It will be beneficial to the whole components of its institutions.

IV. CONCLUSION

In this study, we set out to explore how digital technology like smartphone according to advance learners can be used as a device to develop student's skills in thinking critically and solving problem, good in collaboration, know how to communicate well, creative and innovative to face a digital era in this world. We also doing observations to the interactions between teacher and students during the teaching learning process to investigate what exactly happened in class.

Research and literature in the field gives a positive comment to the implementation of technology device in supporting teaching learning process in class. In this study, students give positive feedback regarding to the utilization of smartphone in class because they can create new learning experience in which they can develop those four C's skills by the way they want. Meanwhile for teacher, they can develop innovative teaching method and strategy, tools and content to lead creative learning.

In conclusion, the impact of using advance technology like smartphone can considered as an alternative way to enrich student's comprehension. And it can create an effective and innovative learning if the utilization is used appropriately. In this case, the institution should provide a good wi-fi connection to the students and must be free to access.

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