

21ST Century Teaching Techniques

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Abstract

The 21st century is a world of advanced-information technology especially the Internet that has brought the world to a tight fit of time and place which is called as “global”. Because of the advanced-information technology, people in the global village can perceive and learn indefinitely, which is both true (fact) and virtual (virtual community) through social media. This phenomenon is known as “Open Theory” where people in open society know each other openly and are agile to change. Those who will survive will need to have the 21st century learning skills which known as “3R8Cs”. According to the 3R8Cs, 3R is meant to reading, arithmetic, and writing. The 8Cs is referred to critical thinking and problem solving, creativity and innovation, cross-cultural understanding, collaboration, teamwork and Leadership, communications, information and media literacy, computing and ICT literacy, career and learning skills, and compassion.

As a result, the 21st century learning skills to develop learners must go through a quality educational process. This could be done by changing from teaching to memorize and answer questions to learning activities that help to improve learning skills by using 1) a smart classroom, 2) a discussion group, 3) a flipped classroom, 4) Science, Technology, Engineering and Mathematics : STEM, 5) CDIO (Conceive Design Implement Operate), 6) a learning management system : LMS, 7) MOOC (Massive Open Online Courseware), 8) a web board instructional technique, 9) a natural room, 10) a mobile learning), and 11) a reading instruction through the 5W3H technique

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Introduction

The 21st century is a world of advanced-information technology especially the Internet that has brought the world to a tight fit of time and space which known as “the global village”. Because of the advancement of information technology, people in the global village can perceive and learn from each other indefinitely through a social media both in terms of fact and visual community. (Cooparat, 2018 : interview) explained that *“this phenomenon is known as “Open Theory” where people in a society have a mutual awareness of each other, and there is a rapid change and a more complexity of a society”*. In addition, (Delors, 2008 : 21-22) mentioned that the conflicts between the universal and the individual, the modern and the traditional, and the object and the mind could be found in a complex society. Those who will be survive must be ready for adjustment and be able to eliminate an imbalance of disability and aging. Therefore, it is important to provide people with knowledge, ability, and 21st century essential skills. The 21st century essential skills are known as “3R8Cs” – “3R” means to the skills of Reading, (A)rithmetic, and (W)riting while “8Cs” means to Critical Thinking and Problem Solving, Creativity and Innovation, Cross-cultural Understanding, Collaboration teamwork and Leadership, Communications, Information and Media Literacy, Computing and ICT Literacy, Career and Learning Skills, and Compassion. As a result, the educational process must be changed from teaching to memorization to providing learners with learning activities because there are many options in the world for educational process. Moreover, the mind set of new generation does not want to study in the classroom. They do not want to study compulsory subjects and they want to be free. However, they are confusing in their own ways (Chaos Aspect) about what they really need. Therefore, the teacher is the most important in education management for future people. Because teachers are the mentors of ideas for learners to discover their aptitudes and interests that lead to “3R8Cs” which considered as a re-skill process for an interdependent understanding about the world and for a sustainable combination of innovative workforce and creative workforce into artificial intelligence or AI.

Overview of Holistic Education

Education means the learning process for the advancement of individuals and society through knowledge transferring, training, cultural heritage, creativity to

maintain academic progress, and creation of knowledge based on a management of environment, society, learning, and supporting factors for a life-long learning of individuals. Education shall aim at the full development of the Thai people in all aspects: physical and mental health; intellect; knowledge; morality; integrity; and desirable way of life so as to be able to live in harmony with other people. According to Section 23, education through formal, non-formal, and in-formal approaches shall give emphases to knowledge, morality, learning process, and integration of the following, depending on appropriateness of each level of education including: (1) knowledge about oneself and the relationship between oneself and society, namely: family, community, nation, and world community; as well as knowledge about the historical development of the Thai society and matters relating to politics and democratic system of government under a constitutional monarchy; (2) scientific and technological knowledge and skills, as well as knowledge, understanding and experience in management, conservation, and utilization of natural resources and the environment in a balanced and sustainable manner; (3) knowledge about religion, art, culture, sports, Thai wisdom, and the application of wisdom; and (4) knowledge and skills in mathematics and languages, with emphasis on proper use of the Thai language.

From the past, the quality of education and learning of Thai people is still relatively low. However, Thai people have higher education opportunities which can be seen through a continuous increasing number of average years of study of working-age population (during 15-59 years old) from 8.8 in 2008 to 9.3 in 2015. Interestingly, when the O-NET (Ordinary National Educational Test) score of 2015 is taken into a consideration, it is found that the average O-NET score is lower than 50%. Further, the average PISA score is also lower than other countries with similar levels of development. This is because of the important limitations of Thai education both in terms of curriculum and instructional systems emphasized on memorization that leads to a lack of creativity of learners, finally. In addition, the Programme for International Student Assessment (PISA) is also continuously provided every 3 years by a cooperation of the Institute for the Promotion of Teaching Science and Technology (IPST) under the Ministry of Education and the Organization for Economic Co-operation and Development (OECE) to follow the changes in the quality of education which focused on students who are about to enter the labor market in the future because they finish a compulsory education (a group of student about 15

years old). PISA focuses on a measurement of 15-year-olds' ability to use their science, reading and math knowledge and skills to meet real-life challenges. According to PISA, a reading literacy, a mathematic literacy and a scientific literacy are considered as the important skills for a lifelong learning. If the PISA score is relatively high, it is believed that it will be a country with high quality manpower in the future which is suitable for economic competition with other countries and a worth country for investment.

The PISA's assessment result in 2015 from 72 countries and about 540,000 of 15-years-old-students participated found that, in general, students of economic countries have the highest score from all countries and they are ranked as follows: Singapore, Japan, Estonia, Macau, and Hong Kong; according to a measurement of reading, mathematic and scientific literacy (a standard score was set at 500). However, when considering each category, the top 5 of each category are: 1) scientific literacy – Singapore (556 points), Japan (538 points), Estonia (534 points), Chinese Taipei (532 points), and Finland (531 points); 2) reading literacy – Singapore (535 points), Canada (527 points), Hong Kong (527 points), Finland (526 points), and Ireland (521 points); and 3) mathematic literacy – Singapore (564 points), Hong Kong (548 points), Macau (544 points), Chinese Taipei (542 points), and Japan (532 points). According to the results presented above, it is noteworthy that countries with high scores are mainly oversee Chinese.

From the problems above-mentioned, teachers must change their teaching behavior by teaching without teaching and do not bring subject in the textbook to tell the students to remember. Teachers must be a learning designer and facilitator. According to the learning process, students have to learn from practice by providing questions to create curiosity for students as motivational inspiration for alert learning. This will lead to a learning and teaching activity that provides learners with the 21st century skills. This is in accord with Panitch (2018) who states that according to the 21st century learning, teachers serve as facilitator where teachers must work together as a team both in school and or nearby schools in order to create a Professional Learning Community (PLC). Learning must be focused to create systematic thinking, creativity, working skills and lifestyle for learners to enter the labor market with quality.

21st Century Skills

The world of information data is ready to serve on a smart phone; therefore, if students lack of critical reading literacy skills, there will be a problem for them. As a result, reading skills are an important part of living in the 21st century. The reading skills in the 21 century is known as “3Rs + 8Cs 3Rs”. It includes the 3 principle skills as follows:

Reading – this is not a reading instruction as in the past. In term of the new reading instruction, it only means to be able to read, but it also means to **reading literacy**. Therefore, reading literacy is meant to an ability to read, know and understand about ideas that a writer is trying to present. Therefore, reading according to this definition is not mean only an ability to read words correctly. This is what we should to apply to learning and teaching activities.

Writing – it is not only an ability to write correctly. It is a writing that can contain and express a correct idea and meaning through a critical analysis and synthesis for a truth, accuracy, and under a responsibility.

Arithmetic – this is not only meant to an ability to add, subtract, multiply, or divide correctly. It is also meant to an ability of directed thinking. A directed thinking is a thinking for answering, solving problems or leading to goals or targets directly. Results of directed thinking are aimed to help students to make decisions or solve problems with quality. Further, a directed thinking is also considered as a tool for lifelong learning especially in the era when the world is progressing, economic and social system is changing, and is a society of informational development.

According to the light as mentioned in the above, The 3 skills are the principle skills in the 21st century learning by starting from critical reading, writing, and arithmetic.

Other 21st century skills are meant to secondary skills which means to “8Cs” as follows:

1. Critical Thinking and Problem Solving) – this means to a systematic thinking for problem solving. It is found that learning and teaching activities in the 21st century are designed to create a situation that is as close to reality as possible. Then, students are allowed to face the situation that may be through a role play, an online lesson, a picture, a video, and etc. All students have an opportunity to present their opinions, brainstorm or discuss about possible solutions. This kind of thinking skill is the creation of knowledge that results from joint action of students.

2. Creativity and Innovation – the important characteristic of creativity is the freedom of thought without limit. It is an idea that bases on the foresight and is in the way of imagination, variety, and unconventional for a creation of new inventions and innovations that not cause damage.

3. Cross-Cultural Understanding – the difference is due to the diversity of geographical areas and biodiversity. This is in accord with the mobility of world population that makes a society is more complex. Therefore, understanding, accepting, and adjusting in the diversity becomes a necessary skill. As a result, learning and teaching activities that help to create a cross-cultural understanding skill is important for the 21st century learning.

4. Collaboration Teamwork and Leadership – there are 3 skills concerning this category including cooperation, teamwork, and leadership. The primary focus is on leadership, then followed by cooperation. Finally, teamwork is created. Learning and teaching activities to create leadership must be based on the believe that leadership can be created. This consists of communication, personality, intention, sincerity, knowledge, good decision making, and human relationship. A person with these characteristics makes people to trust and need to work with, so there will be a team. Teamwork means to a group of people who work together to achieve the same goal with the same heart and feeling.

5. Communications, Information and Media Literacy – The world in the digital era is the world of news and data system, information system, and networking system. These 3 systems have brought the world to quickly stay close together. This kind of society is called as “social visual” which is likely to be true, but it is not true. Therefore, the teaching principle is to teach student to have a reason and immunity based on virtue and knowledge. If this kind of skill is embedded under a subconscious mind of students, it is believed that it will be possible for students to sustainably live in the world of the 3 mentioned-systems.

6. Computing and ICT Literacy – learning and teaching activities must be focused on benefits from computing and ICT literacy rather than disadvantages of it.

7. Career and Learning Skills – students have to find their own aptitude and interest and practice until becomes a specialist who has knowledge, tolerant, and responsibility.

8. Compassion – it is meant to a continuous lifelong learning to create new inventions especially for the era of AI (Artificial Intelligence) based on the principles of the four sublime states of mind (Office of the Education Council. 2017).

In order to create such the above-mentioned skills for students, teachers have to change their role to be a director of learning by providing learning and teaching activities that help to develop students' 21st century skills.

21st Century Teaching Techniques

There are 11 methods of teaching and learning in the 21st century and each method can be integrated together as following:

1. Smart Classroom

A smart classroom (S.C.) is the learning and teaching management that starts from the integration of teaching science and the advancement of information technology. The 3 main components of smart classroom are teachers, learners, and the media. Each smart classroom must include the following equipment: computers, notebooks, tablets, smartphones, smart boards, projectors, Internet, wireless networks, and hardware (e.g. tables and chairs that can move by wheel, electrical system, audio system, air conditioning, all-round screens). Instructors must plan their teaching and learning activities and determine the essential knowledge for learners to search for knowledge in a broad way. On the other hand, learners will learn happily and love to search for knowledge. The disadvantage of smart classroom is that the expense is too high and need to be invested heavily with smart classroom.

2. Discussion Group

Discussion group refers to discussion, consultation, or discussion meeting. A classroom that employs a discussion group technique is a classroom which provides a discussion of or ideas or experiences between students, teachers and experts. A hot issue to the attention of society will bring to find out who is doing, what, where, how, why, and how to impact. A discussion classroom must create an atmosphere that suits to a situation (e.g. screen, projector, Internet) to those who are interested in presenting to present the origin before the content and conclusion of the issue.

3. Flipped Classroom

A flipped classroom refers to a classroom that provides learning and teaching activities in reversible direction from a teacher to be a student to find what

is needed to study in a classroom. Students and teachers collaborate to find out about the needs of the class. However, a knowledge content determined in curriculum does not leave, but the teacher must present the knowledge of the curriculum that the learner must know through the current information technology (e.g. Facebook, Logbook, YouTube, and etc.). Further, students will be able to attend a class according to their needs, times, or places to study. Most of time in the classroom will be used for activities to find out the answer and knowledge needed by a class. This kind of learning and teaching activities is suitable for the current teaching and learning situation where students are tired of homework assigned by teachers. Therefore, this type of classroom is called as a flipped classroom that teachers and students help and support each other to learn.

4. STEM

STEM stands for Science, Technology, Engineering and Mathematics. It is a learning activity provided through science, technology, engineer, and math which all people think difficult. STEM teaching is the use of materials, toys, machinery, tools, etc., as well as what is around the body, things used in everyday life to extract knowledge about how to make it, what is a mathematical principle behind it, what is the origin of technology to make it. Then, those principles are brought to create a small project from materials around the body. There are 5 outstanding characteristics of STEM as follows: a teaching focused on integration, help students to create a connection between the 4 subjects and their everyday life, a teaching focused on development of 21st century skills, challenging the ideas of students, and allow students to express their opinions. The objective of STEM-based learning and teaching is to encourage students to love and see value of science, technology, engineer, mathematics, and aware that these subjects are close and can be used every day. A STEM-based instruction will bring a lot of fun in the classroom. The students will aware that objects around the body and used in everyday life are derived from the scientific and mathematical principles. However, teachers must prepare teaching in advance.

5. CDIO

CDIO is from “Conceive Design Implement Operate”. The word “Conceive” means to ability to analyze and identify problems in engineering. Design is an ability to design and find solutions to engineering problems. Implement refers to an ability to complete, apply, or solve engineering problems. Operate is an ability to develop and control a system properly. A CDIO-based instruction is a management

aimed to create a teamwork, to encourage students to help each other to solve problems and produce outputs successfully. The output can be used as a sales item to form a startup company or entrepreneur. In short, CDIO is known as “creating, assessing, and learning”. Currently, schools around the world have adopted the CDIO-based instruction in common since the students have to get a product or gain a patent after they graduated.

6. LMS

LMS stands for “Learning Management System” or a learning management system with software that manages learning through website. This system includes learner, instructor, administrator, and system administrator. Instructors provide lessons through an online system (e.g. Instagram, Facebook, YouTube, or Line) together with a test. Students attend classes when they want. Administrators monitor a learning process. A system administrator is planning a teaching system, assessing, monitoring discussion activities, answering questions, and collecting data.

7. MOOC

Massive Open Online Courseware (MOOC) is an online course on free source that can serve massive learners. Students can connect to watching a lecture video, practicing, doing exercises, or talking with others. It is a block course study. If learners need a certificate, they have to pay for a tutor fee for each content. Further, learners can graduate if they select to study subjects determined by each curriculum. Then, compiling all knowledge certificates to form a total credit. If the total credit is enough, a bachelor certificate will be issued.

MOOC is popular in western countries such as at Stanford Oxford, Harvard, MIT, etc. For Thailand, Chulalongkorn University, Thammasat University, Mahidol University, and other universities are developing a MOOC-based instruction. This is because of: 1) cost saving and do not disturbing a work time; 2) learning with experts around the world; 3) meeting and sharing experience with people from different fields, ethics, countries; 4) matching with a personal life style learning; and 5) a continue lifelong learning.

8. Web Board

There are many knowledges uploaded into a cyber system available to teachers for classroom instruction. However, most teachers do not use them for instruction, but they still use books, textbooks, or ready-made lessons for their classroom instruction.

From the problem that students are very knowledgeable in reading and acquiring knowledge but they cannot write correctly especially in report making. Normally, when students are assigned to do a report, they will copy information from Internet and paste in their report. They do not read, analyze, synthesize, or add more things. The result is that the students lack the skills of writing, analyzing, synthesizing, and seeking additional knowledge.

9. Natural Room

Natural classrooms can be found around the school and can use to for learning to take place everywhere and every time. Therefore, the school environment is like a big and important classroom that can manage for learning and teaching activities. Teachers must design learning and teaching activities to create the integration of curriculum knowledge. As a result, students will have the skills of observation and critical thinking automatically. A concept mapping connected with outside classroom learning resources could be produced more than expected to happen.

10. Mobile Learning

Mobile Learning means to take students of a field trip with a guide to explain or give knowledge. During a trip, there is a brief history of the place (e.g. geographical conditions, types of residence, ways of life, etc.). This kind of classroom will create an observation skill and a direct experience to answer students' interests and aptitude.

11. 5W3H Technic for Reading Literacy

The teacher must provide students with current appropriate teaching and learning activities. 5W3H means that after reading, readers must be able to talk about reading details (e.g. who, what, where, when, why, how long, how much, etc.). Therefore, every time of reading, readers will need to distinguish details to form a mind map. As a result, the teachers are important for instruction in the present world.

After students have been taught repeatedly by the teachers until it becomes a reading habit, this leads to a critical life-skills in terms of reading comprehension, analyzing skill, differentiating skill, synthesizing skill, and summarizing skill. Such the mentioned skills help students to conquer PISA's test since the test is designed in terms of analytical thinking and 21st century learning.

Concluding Remarks

The 21st century teaching techniques require teachers to change their teaching behaviors. In other words, the teachers have to design learning and teaching activities to facilitate students to learn in a practical way. Questions to create curiosity for students as the motivational inspiration to alert learning must be provided. This will lead to a learning and teaching activity that provides learners with the 21st century skills. In addition, teachers must work together as a team both in school and or nearby schools in order to create a Professional Learning Community (PLC). Learning must be focused to create systematic thinking, creativity, working skills and lifestyle for learners to enter the labor market with quality. The following 21st century teaching techniques 1) smart classroom; 2) discussion group; 3) flipped classroom; 4) STEM; 5) CDIO; 6) LMS; 7) MOOC; 8) web board; 9) natural room; 10) mobile learning; and 11) 5W3H technique for reading literacy. Should be done and taken into about. So, students will be able to adjust themselves and it will lead to the skill of “3R8Cs” which considered as a re-skill process for an interdependent understanding about the world and for a sustainable combination of innovative workforce and creative workforce into artificial intelligence or AI.

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