Characteristics and Learning Models of the 21st Century

Riska Wulandari

Universitas Sebelas Maret
wulan.rwd12@gmail.com

Abstract
21st-century learning is oriented toward student-centered learning. 21st-century learning is learning that provides 21st-century skills to students, known as 4Cs which includes Critical thinking and problem-solving skills, Communication, Collaboration, and Creativity and innovation. This has become an important issue that needs to be considered, studied, and developed by teachers in learning activities as an effort to face the challenges and demands of 21st-century learning. Characteristics of 21st-century learning need to be recognized and the learning models applied in the learning process needs to lead to the demands of 21st-century learning. This article aims to provide insight into the characteristics and learning models of the 21st century. Data collection was carried out using the literature study method, which examining various relevant references. The characteristics of 21st-century learning are integrative, holistic, scientific, contextual, thematic, effective, collaborative, and student-centered. Meanwhile, 21st-century learning models include Discovery Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Problem Based Learning, and Project-Based Learning.
Keywords: *Learning characteristics, Learning models, 21st-century learning*

Abstrak
Pembelajaran abad 21 berorientasi pada pembelajaran yang berpusat pada siswa. Pembelajaran abad 21 adalah pembelajaran yang memberikan keterampilan abad 21 kepada siswa, yang dikenal dengan 4Cs yang meliputi Keterampilan berpikir kritis dan pemecahan masalah, Komunikasi, Kolaborasi, serta Kreativitas dan inovasi. Hal ini menjadi isu penting yang perlu diperhatikan, dikaji, dan dikembangkan oleh guru dalam kegiatan pembelajaran sebagai upaya menghadapi tantangan dan tuntutan pembelajaran abad 21. Karakteristik pembelajaran abad 21 perlu dikenali dan model pembelajaran yang diterapkan dalam proses pembelajaran perlu mengarah pada tuntutan pembelajaran abad 21. Artikel ini bertujuan untuk memberikan wawasan tentang karakteristik dan model pembelajaran abad ke-21. Pengumpulan data dilakukan dengan metode studi literatur, yaitu meneliti berbagai referensi yang relevan. Karakteristik pembelajaran abad 21 adalah integratif, holistik, saintifik, kontekstual, tematik, efektif, kolaboratif, dan berpusat pada siswa. Sedangkan model pembelajaran abad ke-21 meliputi *Discovery Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Problem Based Learning,* dan *Project Based Learning.*
Kata kunci: *Karakteristik pembelajaran, Model pembelajaran, Pembelajaran abad 21*

INTRODUCTION

The current learning direction is oriented to the characteristics of 21st-century learning, namely higher-order thinking skills. The main components of higher-order thinking skills include building knowledge and curiosity (Sasson, Yehuda, & Malkinson, 2018). Education in Indonesia has adopted 21st-century learning. This is stated in the latest curriculum, namely the 2013 curriculum. The 2013 curriculum was developed regarding aspects of developing high-level mindsets. In the 2013 curriculum, high-order thinking skills will be introduced and trained in students from an early age at the elementary school level.

21st-century learning is learning that provides 21st-century skills, which are needed in today's life and the future. 21st-century skills known as 4Cs which include Critical thinking and problem-solving skills, Communication, Collaboration, and Creativity and innovation are believed to be the main skills needed and need to be developed. These 21st-century skills need to be considered, studied, and developed by teachers in learning activities as an effort to face the challenges and demands of 21st-century learning. 21st-century learning has characteristics that characterize the needs and demands of 21st-century learning. The characteristics of 21st-century learning can be adopted in learning activities. The learning process that adopts the characteristics of 21st-century learning is expected to develop 21st-century skills. In the learning process, the characteristics of 21st-century learning can be integrated into learning strategies such as learning models that can encourage the development of 21st-century skills.

Learning models applied in the learning process need to lead to the demands of 21st-century learning. Learning models are the process of organizing learning activities to achieve learning objectives. Learning models based on 21st-century learning will be able to optimally encourage and foster 21st-century skills. Based on this, learning models that adopt the characteristics of 21st-century learning are needed so that they can achieve learning goals in the 21st century. Thus, the demands of 21st-century learning will be met with 21st-century skill outputs. This article aims to provide insight into the characteristics and learning models of the 21st century. 21.

METHODS

This research is a descriptive study with data collection techniques using the literature study method. The method of literature study is data collection based on analysis and study of theory as well as the findings of relevant research results. The theoretical references and research findings obtained are presented as supporting theories as well as research discussions.

RESULTS AND DISCUSSION

21st-century learning is oriented toward student-centered learning. 21st-century learning is also characterized by higher-order thinking skills. In this 21st century learning, there are four important skills known as 4Cs which include critical thinking and problem solving, communication, collaboration, and creativity and innovation (Partnership for 21st Century Skills, 2009). These important skills in the 21st century are relevant to the four pillars of life which include learning to know, learning to do, learning to be, and learning to live together.

Characteristics of 21st Century Learning

According to Ministry of Research, Technology and Higher Education of Indonesia (Kemristekdikti, 2018) the characteristics of 21st-century learning include integrative, holistic, scientific, contextual, thematic, effective, collaborative, and student-centered. First, integrative is an integrated or integrated learning process, namely learning that can link learning activities with the environment and experiences in real life. Second, holistic is an effort to understand concepts and build knowledge as a whole and thoroughly, not just a piece. Third, scientific is a learning activity by carrying out exploration activities to gather information. Fourth, contextual, namely learning efforts by linking material concepts with realities in real life.

Fifth, thematic is a learning process that combines a theme to link one concept to another to provide broader insights and meaningful new experiences. Sixth, effective is a learning process that is right on target and effective so that it can achieve the desired goals. Seventh, collaborative is learning activities that emphasize collaboration and cooperation with each other to achieve goals and encourage active participation and the ability to communicate and discuss. Eighth, student-centered, namely learning activities where the learning process is student-oriented so that the teacher functions as a facilitator.

It is hoped that the characteristics of 21st-century learning can be elaborated in learning activities so that they can present effective and meaningful learning activities and are primarily able to encourage the development of 21st-century skills. In this, the role of teachers is very large in realizing learning that has the characteristics of 21st-century learning. Therefore, it is necessary to continue encouraging teachers to achieve these goals.

Learning Models of the 21st Century

The role of teachers in implementing 21st-century learning is very important. The achievement of 21st-century skills is carried out by updating the quality of learning through the application of learning models that help students develop critical thinking skills, encourage collaboration, collaboration, and communication, increase student involvement and motivation, and build creativity and innovation in learning. 21st-century learning has characteristics that can guide the integration of effective learning models for 21st-century learning. The development or application of learning models must be in line with the characteristics of 21st-century learning which include integrative, holistic, scientific, contextual, thematic, effective, collaborative, and centered. in students so that the learning objectives of the 21st century can be achieved.

Previous studies and research have shown learning models that can help achieve 21st-century learning goals. Chan & Sher (2014) found that collaborative learning models are tools that can help improve students' general and technical work skills. Meanwhile, the problem-based learning model can encourage students' critical thinking skills (Asyari, Al Muhdhar, Susilo & Ibrohim, 2016). Furthermore, the project-based learning model trains skills in different problem solving which then encourages the development of creative thinking (Sart, 2014). Meanwhile, the contextual learning model can improve students' critical thinking skills and train students to be evaluative (Suryawati, Osman & Meerah, 2010). Based on these previous studies and research, 21st-century learning models can include Discovery Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Problem Based Learning, and Project-Based Learning.

1. Discovery Learning

Discovery Learning (DL) is a learning model that is understanding concepts, meanings, and relationships through an intuitive process to finally

conclude. Discovery occurs when the individual is primarily involved in the use of his mental processes to discover some concepts and principles. Discovery activities are carried out through observation, classification, measurement, prediction, determination, and inference. The teacher acts as a companion, designs, and initiates initial material, motivators, and facilitators for students.

The DL model has the following objectives (Hosnan, 2014):
a. To be actively involved in learning.
b. To find patterns and predict additional information.
c. To formulate a question and answer strategy that is not ambiguous for obtaining information.
d. To help students form effective collaborative ways of working, share information, and listen to and use the ideas of others.

The syntax of the DL model are as follows:
a. Giving stimulation.
b. Statement / problem identification.
c. Data collection.
d. Data processing.
e. Verification.
f. Draw conclusions / generalizations.

2. Cooperative Learning

The cooperative learning (CL) model is a learning model in which students learn in small groups of 4-6 people. In the application of this CL model, learning activities will display social interaction, communication, and cooperation among students in groups. According to Slavin, in cooperative learning activities, students will be divided into heterogeneous groups based on their learning abilities, where students will support each other to learn during the learning process (Gull & Shehzad, 2015). The teacher acts as a companion, motivator, and facilitator for student study groups.

There are five principles of cooperative learning as defined by Johnson, Johnson, and Smith (stated in Yusof, Hassan, Jamaludin, & Harun, 2012) that must be emphasized and promoted. The five principles of cooperative learning are:
a. Positive interdependence.
b. Individual accountability.
c. Face to face interaction.
d. Appropriate interpersonal skills.
e. Assessment of regular group function.

Cooperative learning has been widely used by researchers as a teaching strategy that has an impact on improving learning outcomes. There are dozens of strategies in cooperative learning that teachers can use in the learning process (Gull & Shehzad, 2015).

3. Collaborative Learning

The Collaborative Learning (CbL) model is a learning model in which students work in small groups together to achieve learning goals (Gokhale, 1995). This CbL model emphasizes collaborative and collaborative activities (Chan & Sher, 2014). Therefore, this CbL model involves active student participation. In the CbL model, active participation appears in expressing opinions and knowledge that is not conveyed explicitly but emerges from collaborative activities and active dialogue in understanding and applying concepts and techniques (Camarero, Rodriguez, & Jose, 2012). Therefore the

teacher is the facilitator who facilitates these collaborative activities.

The application of the CbL model increases the mastery of knowledge and problem-solving abilities (Purwaaktari, 2015; Armiati & Sastramihardja, 2007), helps attract learning interest and motivation (Smith, Rama & Helms, 2018), and encourages students' critical thinking skills (Gokhale, 1995; Yazici, 2005). Thus, the CbL model can facilitate students together in increasing understanding and encouraging 21st-century skills.

The main purposes of using the CbL model are (Armiati & Sastramihardja, 2007):

a. Active learning.
b. Build writing and communication skills.
c. Provide learning responsibilities.
d. The teacher is a facilitator.
e. Build a self-confident and independent attitude.
f. Provide experience working collaboratively.
g. Supports Peer Reviews.

The CbL model steps include:

a. Students in groups set learning goals and divide tasks.
b. Students in groups carry out activities to collect information by reading, then have discussions.
c. Groups work together in carrying out identification, analysis, and discussion.
d. The group concludes the results of solving the problem and makes a report.
e. One group presents the results of the discussion and the other group observes and responds.
f. The teacher evaluates and provides feedback.

4. Contextual Teaching and Learning

Contextual Teaching and Learning (CTL) learning model is a learning model that allows active involvement and participation of students in activities to seek and process knowledge and gain concrete learning experiences (Rusman, 2012, p. 190). The CTL model involves students in relating subject matter to the real-life context at hand and finding meaning from it.

The CTL model has several components that make up the CTL model. The components of the CTL Model include (Rusman, 2012, p. 191-198; Sujarwo, 2011, p. 49-56):

a. Constructivism, which connects concepts with reality through activities to discover and construct the knowledge found.
b. Inquiry, which is the process of finding knowledge through learning experiences.
c. Questioning, which is to build students' curiosity and critical attitude.
d. Learning community, namely building cooperation.
e. Modeling, namely the activity of presenting a model as an example.
f. Reflection is an activity to evaluate things that have been learned.
g. Authentic assessment.

According to Hakim, Sariyatun, & Sudiyanto (2018) that the implementation of a learning process that provides a construction process such as the CTL model makes students trained in critical thinking by focusing on active learning. The steps for applying the CTL model in the learning process are as follows (Rusman, 2012, p. 199-200):

a. Develop a view of carrying out meaningful learning activities.
b. Carry out the inquiry activity.
c. Raise questions.

d. Creating a learning community through groups.
e. Presenting a model as an example of learning.
f. Get used to reflection activities.
g. Conduct an objective assessment.

5. Problem Based Learning

The Problem Based Learning (PBL) model is a learning model that spurs active students (Silva, Bispo, Rodriguez, & Vasquez, 2018). This PBL model emphasizes problem-solving (Wyness & Dalton, 2018), and can stimulate students' critical thinking (Asyari, Al Muhdhar, Susilo & Ibrohim, 2016).

The characteristics of the PBL model are as follows (Rusman, 2012, p. 232-233):
a. The issues raised are in the form of facts.
b. Many points of view are needed in seeing the problem.
c. Utilizing and sorting sources of information.
d. Build problem-solving skills.

PBL is a student-centered learning model. The learning steps using the PBL model are as follows (Arends, 2001, p. 362-366):
a. Provide orientation about the problem to students.
b. Organize students for research by developing collaborative skills through the formation of investigative teams and cooperative planning.
c. Assisting independent and group investigations by encouraging students to collect data and experimentation and develop hypotheses, explain, and provide solutions.
d. Developing and presenting artifacts, namely written reports accompanied by supporting instruments such as videos, recordings, etc. as a result of research and investigations; and exhibits, namely demonstrations or presentations of work.
e. Analyze and evaluate the problem-solving process.

6. Project-Based Learning

The Project-based Learning (PjBL) model is a learning model that involves students' devotion in solving problems, carried out in groups / independently through scientific stages with a certain time limit as outlined in a product to then be presented to others.

The characteristics of PjBL include:
a. Completion of tasks is carried out independently starting from the planning stage, preparation, to product exposure.
b. Students are fully responsible for the project that will be produced.
c. The project involves the roles of peers, teachers, parents, and even the community.
d. Train creative thinking skills.
e. The classroom situation is very tolerant of deficiencies and development of ideas

The work steps of the PjBL model are as follows (Jalinus, Nabawi, & Mardin, 2017):
a. Formulation of expected learning outcomes.
b. Understanding the concept of teaching materials.
c. Skills training.
d. Designing the project theme.
e. Mark the project proposal.
f. Carry out project tasks.
g. Presentation of project reports

CONCLUSION

21st-century skills are a major goal that needs to be achieved to meet the demands of learning today and in the future. 21st-century skills can be encouraged through 21st-century learning activities. 21st-century learning needs to have special characteristics, namely 21st-century learning characteristics which include integrative, holistic, scientific, contextual, thematic, effective, collaborative, and student-centered. In the learning process, learning strategies can be used such as learning models to integrate the characteristics of 21st-century learning. 21st-century learning models that can be used include Discovery Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Problem Based Learning, and Project-Based Learning. It is hoped that this article can help provide insight into the character concepts and learning models of the 21st century, especially for teachers.

REFERENCES

Arends, R. I. (2001). *Learning to Teach (5th ed.)*. New York: McGraw-Hill Companies.

Armiati, S. & Sastramihardja, H. S. (2007). Collaborative Learning Framework. *Seminar Nasional Aplikasi Teknologi Informasi*, ISSN: 1907-5022, 29-32. https://journal.uii.ac.id/Snati/article/view/1614/1389

Asyari, M., Al Muhdhar, M. H. I., Susilo, H., & Ibrohim, I. (2016). Improving critical thinking skills through the integration of problem-based learning and group investigation. *International Journal for Lesson and Learning Studies*, 5(1), 36–44. https://doi.org/10.1108/IJLLS-10-2014-0042

Chan, T. W. C. & Sher, W. (2014). Exploring AEC education through collaborative learning. *Engineering, Construction and Architectural Management*, 21 (5), 532-550. https://doi.org/10.1108/ECAM-04-2013-0036

Camarero, C., Rodriguez, J. & Jose, R. S. (2012). An exploratory study of online forums as a collaborative learning tool. *Online Information Review*, 36 (4), 568-586. https://doi.org/10.1108/14684521211254077

Gokhale, A.A. (1995). Collaborative learning enhances critical thinking. *Journal of Technology Education*, 7 (1), 22-30. https://doi.org/10.1007/978-1-4419-1428-6_910

Gull, F. & Shehzad, S. (2015). Effects of Cooperative Learning on Students' Academic Achievement. *Journal of Education and Learning*, 9 (3), 246-255. https://doi.org/10. 11591/edulearn.v9i3.2071

Hakim, M. F. A., Sariyatun, S., & Sudiyanto, S. (2018). Constructing Student`s Critical Thinking Skills Through Discovery Learning Model and Contextual Teaching and Learning Model as Solution of Problems in Learning History. *International Journal of Multicultural and Multireligious Understanding*, 5 (4), 175-183. http://dx.doi.org/10.18415/ijmmu.v5i4.240

Hosnan, M. (2014). *Pendekatan Saintifik dan Kontekstual dalam Pembelajaran Abad 21*. Bogor: Ghalia Indonesia.

Jalinus, N., Nabawi, R. A., & Mardin, A. (2017). The Seven Steps of Project Based Learning Model to Enhance Productive Competences of Vocational Students. *1st International Conference on Technology and Vocational Teachers (ICTVT), Advances in Social Science, Education and Humanities Research*, 102, 251-256. https://doi.org/10.2991/ictvt-17.2017.43

Kementerian Riset, Teknologi dan Pendidikan Tinggi: Direktorat Jenderal Pembelajaran dan Kemahasiswaan, Direktorat Pembelajaran. (2018). *Bentuk Pembelajaran Abad 21*. Jakarta: Dirjenbelmawa, Kemristekdikti.

Partnership for 21st Century Skills. (2009). *P21 Framework Definitions*. Retrieved from https://files.eric.ed.gov/fulltext/ED519462.pdf

Purwaaktari, E. (2015). Pengaruh Model Collaborative Learning Terhadap Kemampuan Pemecahan Masalah Matematika Dan Sikap Sosial Siswa Kelas V SD Jarakan Sewon Bantul. *Jurnal Penelitian Ilmu Pendidikan*, 8 (1), 95-111. https://doi.org/10.21831/jpipfip.v8i1.4932

Rusman. (2012). *Model-model Pembelajaran: Mengembangkan Profesionalisme Guru*. Jakarta: Rajawali Pers.

Sart, G. (2014). The effects of the development of metacognition on project-based learning. *Procedia: Social and Behavioral Sciences*, 152, 131-136. https://doi:10.1016/j.sbspro.2014.09.169

Sasson, I., Yehuda, I., & Malkinson, N. (2018). Fostering the Skills of Critical Thinking and Question-posing in a Project-based Learning Environment. *Thinking Skills and Creativity*, 29, 203-212. .

https://doi.org/10.1016/j.tsc.2018.08.001

Smith, T. E., Rama, P. S., & Helms, J. R. (2018). Teaching Critical Thinking in GE Class: A Flipped Model. *Thinking Skills and Creativity*, 28, 73-83. https://doi.org/10.1016/j.tsc.2018.02.010

Silva, A. B. Da, Bispo, A. C. K. de A., Rodriguez, D. G., & Vasquez, F. I. F. (2018). Problem-based learning: A proposal for structuring PBL and its implications for learning among students in an undergraduate management degree program. *Revista de Gestão*, 25(2), 160–177. https://doi.org/10.1108/REGE-03-2018-030

Sujarwo. (2011). *Model-model Pembelajaran: Suatu Strategi Mengajar*. Yogyakarta: Venus Gold Press.

Suryawati, E., Osman, K. & Meerah T. M. (2010). The Effectiveness of RANGKA Contextual Teaching and Learning on Student's Problem Solving Skill and Scientific Attitude. *Procedia: Social and Behavioral Sciences*, 9, 1717-1721. https://doi:10.1016/j.sbspro.2010.12.389

Wyness, L., & Dalton, F. (2018). The value of problem-based learning in learning for sustainability: Undergraduate accounting student perspectives. *Journal of Accounting Education*, 45(August 2017), 1–19. https://doi.org/10.1016/j.jaccedu. 2018.09.001

Yazici, H. J. (2005). A study of collaborative learning style and team learning performance. *Education + Training*, 47 (3), 216-229. https://doi.org/10.1108/ 00400910510592257

Yusof, K. M., Hassan, S. A. H. S., Jamaludin, M. Z., & Harun, N. F. (2012). Cooperative Problem-based Learning (CPBL): Framework for Integrating Cooperative Learning and Problem-based Learning. *Procedia: Social and Behavioral Sciences*, 56, 223–232. https://doi.org/10.1016/j.sbspro.2012.09.649