Blended learning best practice to answers 21st century demands

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Abstract. Identify and explore various 21st century skills that indicate the demands that must be mastered by a person. This still corresponds to the four pillars of life which include learning to do, learning to know, learning to be, and learning to live together. Education is a means to form these various skills, such as metacognition, critical thinking skills, problem solving, communication skills, and collaboration, information literacy, and various other skills. This research is a descriptive study with a Systematic Literature Review (SLR). This research focuses about designing learning activities that empower metacognition, contextual, and develop student-centered learning to achieve meaningful learning concepts that are expected to gain competent quality output. Various ways can be implemented in the learning process, one of which is by cultivating creativity and innovation in learning through blended learning. The results show that blended learning indicates high learning outcomes compared to online learning and face to face because blended learning is a model that combines the advantages of face-to-face learning models with e-learning models by developing various learning media. Blended learning as an alternative solution to overcome the weaknesses of online learning and face-to-face learning to produce a series of learning that is efficient, effective, and fun for students. The interaction and communication of blended learning between and between teacher-students can continue and this is the main attraction of learning in this 21st century era.

1. Introduction
Responding to the skills demands of the 21st century, which have an impact on the world of education, especially in Indonesia. The implications of industrial euphoria 4.0 have an impact on the form of educational services provided by teachers to students, the perspective that develops in the learning memory of the 21st century contains the urgency of the new learning innovations needed to overcome complex global challenges. These updates are needed to create new forms of learning needed to tackle complex global challenges. Identification of student competencies and skills that need to be closely developed to face the challenges of the 21st century. The traditional approach of memorizing is not sufficient for developing higher order thinking skills and independence of students [1].

The era of the 21st century with digitalization in various fields of life including education has changed the paradigm and order of the learning process, so digital literacy is very much needed and is the most important part of knowledge and skills that must be possessed in the 21st century as seen in Figure 1. Towards and preparing for success in the 21st century must have synergy between the various knowledge and skills of the 21st century that must be possessed. In other words, how to utilize digital literacy which includes information literacy, media literacy, and communication information literacy.
as concepts and tools to improve the quality of learning. Improving learning can not only be implemented partially by optimizing one subject only in this 21st century subject, but how can we machine and exploit the opportunities of the digitalization era with digital literacy to improve the learning process that will produce good output on learning. The subject of digital literacy is used as a literacy culture builder in students who can improve students' Higher-Order Thinking Skills (HOTS). The digital literacy culture that is integrated into learning activities in the classroom must be oriented towards the Higher-Order Thinking Skills (HOTS) of students, so that they can create more conducive learning activities and ultimately produce effective learning outcomes based on HOTS. By utilizing a digital literacy culture, the other 21st command subjects (life skills and caregivers, learning skills, and innovation) will be formed effectively through the learning process.

![Figure 1. 21st century knowledge and skills](image)

What do graduates need to be able to compete in the 21st century? The world of work in the 21st century has seen a significant change that emphasizes information and knowledge and is more complete, multicultural, and international [3]. Information and communication technology has changed study habits, the nature of work that can be done, and the meaning of social relationships. Currently, indicators of success are based more on the ability to communicate and process information to solve complex and adaptive problems, innovate to update new situations, turn situations into opportunities, and harness the potential of technology to create new knowledge. Updating competency standards is needed so that students will have the competencies needed in the 21st century. Schools are challenged to make effective learning reforms to prepare students who are successful in work and life through skill acquisition, higher-order thinking, flexible problem solving, collaboration, and innovation.

Especially during the Covid-19 pandemic, the digital literacy movement has become a fundamental need to be able to participate in various activities including the learning process in the current new normal and digitalization era. Also, digital literacy skills are needed as an effort to anticipate the spread of negative information during the Covid-19 period. The digital literacy movement will create a social order with a critical-creative perspective. The digital literacy movement is needed to improve higher-order thinking skills in everyday life. The digital literacy movement encourages individuals to have the skills to find, use, create information, and utilize it in a healthy, wise, intelligent, accurate, and precise manner. In the end, the industrial revolution 4.0 is not just an echo and euphoria, more than that humans have to transform and understand the concept of the digital literacy movement as an alternative and a tool to form the skills needed to answer guidance in the 21st century.

2. Research methods
This research is a descriptive study with a Systematic Literature Review (SLR) or systematic literature review is a literature review method that identifies, assesses, and interprets all findings on a research topic, to answer pre-defined research questions [4]. The author describes this by collecting, compiling,
and interpreting existing data than analyzing the data, and examining more clearly the various factors related to the conditions, situations, and phenomena being investigated.

3. Results and discussion

3.1. 21st Century learning
Skills trends in the 21st century still corresponds to the four pillars of life which include learning to do, learning to know, learning to be, and learning to live together. Education is a means to shape these skills, such as higher-order thinking skills, metacognition skills, self-regulation skills, creative innovation, information literacy, and various other skills. The teacher's ability to apply the four pillars of education means that the learning process must prepare students to master how to acquire knowledge, have opportunities between students, and explore social phenomena so that they can develop themselves and shape students' character and skills. Learning breakthroughs like this can only be realized by being facilitated by teachers who are full of innovations, adequate equipment, capable of empowering all sources of information and technology as well as selected materials and flexible enough time.

Each individual must be involved in close inquiry-based learning, it is necessary to evaluate and modify the learning process because current learning trends are not only focused on learning outcomes that are converted into forms and rankings but what is much more important is how to form characters and the higher-order thinking skills students need to meet the challenges of the 21st century. Every student has a different way of learning, so teachers are challenged to find ways to help all students learn effectively. Studies have shown that there are forms of pedagogy that are consistently more successful than others in helping students acquire meaningful learning about 21st century skills. The pedagogy in question includes personal learning strategies, collaborative learning, and informal learning.[5] Students must be skilled and able to improve self-competence to be able to overcome global challenges, such as higher-order thinking skills, self-regulation skills, innovating, and solving problems through negotiation and collaboration.

Then why is it necessary to change learning in this digital era? The need for soft skills (self-regulation ability, emotional intelligence, empathetic courtesy and good communication skills), social skills (working in teams, ability to make decisions, recommendations, building professional and leadership relationships), and learning skills (time management, creative and innovative thinking techniques and being able to turn challenges into opportunities). One aspect that can be taken as a whole to improve human resources is in the field of education. Education is a means to form these special skills, by improving and renewing effective and innovative learning processes so that they can answer the challenges of the 21st century.

3.2. What does it take to respond to the demands of the 21st century?
The industrial revolution 4.0 is an event of changing the educational paradigm that focuses on renewable objects of knowledge and the application of knowledge innovation. One of the important elements that must be considered in order to encourage economic improvement, increase comparative advantage and competitive advantage is to prepare a more innovative learning system and increase the competence of graduates who have 21st century learning and innovation skills.[6] In response to this, it was found that many information technology innovations were created and empowered them in various learning process practices in schools.

But the facts that happen in education today are the first, an educational approach that is only focused on developing the Intelligence Quotient (IQ) of students without honing the Emotional Intelligence (EQ) and Spiritual Quotient (SQ) abilities, all of which are devices that work in one unit. systems that are interconnected (interconnected) in the personality of one's personality, of course, this is no longer relevant at this time and in the future because the knowledge of memorizing very easily replaced by artificial intelligence, the urgent thing that is needed is that students form skills that are not it's just a habit but it also shapes sensitivity, taste, and creativity. Individuals by combining all
these skills are expected to be able to solve complex problems, carry out evaluations, be able to turn complex challenges that are handled not only by relying on intelligence but also innovation into opportunities for educational innovation.

Second, the euphoria of the 21st century ushered in lively competition with the nation's competitiveness in the era of the 4.0 industrial revolution including in the field of education so that technological advances now allow students to learn online. Recently, many researchers have published their research results related to the advantages of online learning which is claimed to be the best learning system by describing the many benefits and advantages of online learning systems that can improve student learning outcomes. According to the author, there is nothing wrong with various innovations made in information technology in online learning systems, but it would be better if we see from various perspectives that an innovation that is made as good as any, there are still deficiencies that cannot be ignored. The essence of learning today is not just transforming all learning activities and utilizing technology as optimally as possible which can be accessed as a spectacle and self-personalization requirements, but there is one aspect that seems to have escaped our view, which is education which requires guidance that can be exemplified by students. holistic. Educators must be able to educate students who not only memorize (IQ), do manual work, but who can do analytical work, process evaluation, creativity, and a problem-solving complex.

As Aristotle said, "educating the mind without educating the heart is not education at all". Guidance on character education and optimization of ordering skills and thinking skills cannot be replaced by technological sophistication, this can be done with synergized optimization through face-to-face learning, direct interaction between educators and students, not only the transfer of knowledge but also being educators who have creativity, taste, and initiative either implicitly or explicitly which can shape the character and skills of students that will lead to life success. One of the reasons is because the school has a figure of an educator and how to collaborate with learning in an environment that will become a "learning object" which is used and imitated as a guide to ordering the character and skills of these students. One thing is certain, character-building cannot be done partially by prioritizing only one perspective, let alone ceremonial. The formation of student character and skills must be fully planned and implemented across sectors that need interaction and cooperation of all parties and planning an appropriate learning approach. Therefore, blended learning is the best solution for how to combine the advantages of both online and face-to-face learning system approaches as well as a solution to the shortcomings of the two learning systems.

The general challenges that schools face and how blended learning helps solve them are as follows.

- **improve skills;** Students who enter schools with different (heterogeneous) backgrounds, responsibility is the biggest general challenge for schools. The presence of innovative teachers with various skill-based software innovations and adaptive platform technology can improve students who have an understanding of knowledge or who need more intensive practice to build skills and understanding in heterogeneous students.
- **teacher time;** Mixed learning is very useful when students learn online, teachers can then focus attention on small groups, give different attention to students who have gaps in learning absorption or exploration of activities with students and help students reach the deepest level of learning (meaningfull learning).
- **cognitive load (level of intellectual challenge) of the curriculum;** Educators need to look at the preparation and cognitive data standards that have been set in the curriculum. The role of blended learning in achieving teacher learning is to have expertise in assessing student skills and habits. Project and problem-based learning as pedagogical strategies help students to achieve deep learning, build skills and prevent deep learning [7].

### 3.3. Why **blended learning**?

The main domains of 21st century skills are effective communication, digital literacy, high productivity, intensive thinking, and spiritual and moral values [8]. 21st century skills and attitudes are classified as habits of higher order thinking (critical and creative thinking), learning strategies (literacy
and soft skills), and interaction strategies (personal, social, and civic responsibility) \[9\]. Critical thinking skills, creative thinking skills, communication skills, and skills identified by the US-based Partnership for 21st Century Skills (P21) were identified as competencies needed in the 21st century. These competencies are known as 4C competencies. Blended learning comes as a catalytic approach to the learning process that is right in combining the advantages of online learning where students and teachers can empower various multimedia sources of interactive learning to open their treasures (wealth) of knowledge according to existing technological advances with the advantages of face-to-face learning by reinterpreting the information obtained outside the classroom which is an important aspect of a teaching and learning process, namely the acquisition of knowledge and skills.

The use of Information, Communication, and Technology (ICT) in education has changed the way of learning from conventional face-to-face learning to digital-based learning. Technology in conceptual learning is proven to contribute to learning activities in the form of knowledge of learning problems, the provision of professional staff who can arouse learners to learn, various learning resources, and the need for the latest information that can be accessed quickly \[10\]. Many digital-based learning media innovations allow students to learn independently, resulting in online learning or offline learning.

However, safe online learning between teachers and students in learning activities related to the feedback needed on the learning process and the integrity or understanding of the information conveyed to students via online often experiences misconceptions, even though online learning features have been equipped with development video conferencing and web chat with students, students also need direct interaction with each other. Besides, there is the only aspect that cannot be regulated by the online learning process, namely how educators form the character of students. So that no matter how sophisticated the advancement of science and technology, it will not be able to replace teachers who not only educate the mind but also educate the heart because teachers have creativity, taste, and initiative in building structures that govern the character and skills of individual students to answer the challenges of the 21st century. study skills and innovation.

Blended learning is a solution to the weaknesses of online and face-to-face learning systems because it combines online, offline, and face-to-face learning. Online learning consists of media equipped with a control device used by the user so that the user can access it. Offline media is not equipped with an internet network, for example, tutorial form materials in the form of interactive CDs or media that have been made through applications that can be used by students without being connected to an internet network. Various studies in various faculties state that many teachers are interested in online learning but directly adding online learning needs direct learning to provide feedback between teachers and students \[11\].

Blended learning is a learning system with technology development with a combination of face-to-face learning so that it can produce more effective and efficient learning. This learning is balanced between face-to-face and online learning, namely by using multimedia that is loaded on computers, cellphones, video connections, and other technology media. Teachers and students can communicate even though they are at different distances and places, then equipped with face-to-face learning that allows evaluating problems in online learning materials and overcoming various problems of student absorption gap in the learning process.

3.4. Blended learning: combining the advantages of two learning systems
At first, the term blended learning is also known as the learning concept that combines face-to-face, online and offline learning, but recently it has changed to blended learning. Mixed, namely a mixture or combination while learning is learning. Blended learning is a combination face to face learning, traditional learning concepts that are often carried out by education through direct material delivery to students with online and offline learning that emphasizes the use of technology \[12\]. Blended learning combines face to face learning with the help of Information and Communication Technology (ICT), the advantages are:

- students explored the learning material.
• can interact with friends
• discuss groups and exchange opinions.
• access e-library, virtual class.
• online assessment.
• access to learning blogs.
• online seminars (webinars).
• view expert lecturers on YouTube.
• learn online via video and audio.
• virtual laboratory.

Blended learning also has specific boundaries, a learning process that combines various learning models, learning styles and the use of various technology and communication-based learning media; second, a combination of independent learning through online with face-to-face learning between teachers and students; third, learning that is supported by effective learning from the way of delivery, how to learn and learning styles; Fourth, in mixed learning, parents, and teachers also have an important role in the learning of students and the teacher is a facilitator while parents are motivators in their children's learning[13].

Blended learning provides more opportunities for educators and students to interact because of the flexibility in learning space, time and place. The blended learning model is a catalyst and support for personalized learning by each student in the process of forming various skills and competencies. Furthermore, blended learning can provide modalities and opportunities to improve student self-regulation and learning experiences by increasing access to the learning content and training that students need. Each student can optimize learning by giving him or her the freedom to explore information at different levels of learning absorption, there by focusing on the scope of needs that will keep students in their own "learning zone" even though initially they have different absorption and even metacognitive gaps. So, Blended learning is a "full strategic" learning approach in the transformation from one system for all models to a student-centered system.

Blended learning can empower teachers through technology to do their best, build meaningful learning interactions with students, evaluate student processes, and contribute to solving problems and training students to succeed. Access to online learning provides data and resources to students staying on “learning objects” and “moving forward” in ways previously deemed impossible. For example, the emergence of an enhanced adaptive technology system to support learning. The empowerment of various technologies and interactive learning designs by teachers can identify the needs of each student and catalyze their self-regulation and learning experiences to accelerate their success. If there is a gap, it must be overcome by optimizing the use of information technology and interaction in the learning process.

3.5. Implementation of blended learning
Various integrated learning implementations have proven to be effective in the learning process, so that the expected results are not only increased learning outcomes but can also be a means to improve the learning process to form student skills and competencies. The various studies regarding the implementation of the blended learning implementation from researchers can be as follows.

• blended learning is very useful because it is innovative, produces active learning, more personal, student-centered, and more attractive learning for students, and can improve student learning achievement[14].
• blended learning provides additional opportunities for teachers and students to learn. Blended learning also helps teachers prepare students to create learning environments with individual student learning styles and can help students face future challenges[15].
• blended learning has a high effect on results compared to online and face-to-face learning because blended learning combines or blends conventional or traditional learning with traditional learning by developing various learning media. Blended learning is a solution to overcome the weaknesses of face-to-face and online learning which results in an efficient and
effective learning series for students without eliminating pleasant learning experiences with conventional strategies [16].

- further research on a web search as a tool and learning which is quite efficient. Teachers claim that searching the web helps create a learning environment, fosters creativity, creativity, and has a motivational effect on learners [17].

- applying the mixed learning model with students and comparing the scores with those resulting from the traditional learning model, those who study the mixed learning model for the development of critical thinking have higher scores learning with the traditional learning model. Also, it was found that student satisfaction with the blended learning model was at a high level [16].

- then examining the effectiveness of blended learning based on the STEM approach to Schoology-assisted education to improve critical thinking skills shows that classes that apply a blended learning system based on the STEM education approach can improve students' critical skills [19].

Based on the description above, the author is interested in making innovation in the learning process in schools in responding to the challenges of the 21st century namely the blended learning system assisted with WebQuest learning media. WebQuest is an inquiry activity that can be carried out by students by collecting some or all of the information from resources on the internet, optionally supplemented with video documentation [20]. WebQuests as a tool to develop skills, analyze, and synthesize skills. Eight WebQuest best practices that are urgently needed in the 21st century such as: creating collaborative and cooperative tasks, fostering critical thinking, creative problem management and innovative ideas, written and oral communication in assignments, integrating initial and requiring ICT skills from to the end, constructing knowledge, combining various methods into tasks that encourage adaptability, creating real authentic, applicable, contextual, and instilling individual and global accountability and responsibility into the task [21].

WebQuests of either short or long duration is deliberately designed to take advantage of students' time. To achieve efficiency and clarity of learning objectives WebQuests must have at least the following sections:

- an introduction provides some background information.
- tasks that are doable and interesting.
- a collection of sources of information needed to complete a task. Much information is included in WebQuest documents that can be obtained as a pointer to information on the Internet World Wide Web. WebQuest lets students explore information from web documents, e-books, experts available via email, as well as other documents that are physically available in a setting.
- description of the process, an explanation of the fun steps that students must go through in completing the assignment.
- some guidance on how to build on the information obtained, in the form of a question guide, or direction to complement the organizational framework such as schedules, concepts, or cause-and-effect diagrams.
- a wording that comes out of closure for observation, learners about what they have created, and encourages them to expand the experience to other domains [20].

An attractive Webquest design will stimulate students to think creatively and critically. Besides, students can explore lessons more by not managing study time only in class, because they have a study room that can be accessed at any time. Thus students can determine ideas for diagnosing and can enforce the information they find when implementing on their own [22]. Thus, blended learning assisted by Webquest learning media is a combination of the advantages of two learning systems (online and face-to-face learning) as well as an alternative solution to the weaknesses of two learning systems (online and face-to-face learning).
4. Conclusion
With various researches, researchers show that blended learning indicates high results compared to online learning or face-to-face learning because blended learning combines face-to-face learning with online learning by developing various interactive multimedia learning media. Blended learning is an alternative solution for overcoming the weaknesses of online learning and face-to-face learning to produce effective learning sequences to increase class efficiency and support increased discussion or review of information outside the classroom, efficient and fun for students. With integrated learning interactions and communication between students and between teacher-students can be sustainable and this is the attraction of learning to answer the challenges in the 21st-century era.

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