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EXPLORING MODERN EDUCATIONAL THEORIES: A LITERATURE REVIEW OF STUDENT LEARNING IN THE DIGITAL AGE

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Abstract: This study aims to examine the application of modern educational theories, namely Connectivism, Humanism, Cognitivism, and Constructivism, to the learning process of students in the digital era. Through literature studies, this study traces how these four theories contribute to shaping a more relevant and practical learning approach amid the rapid development of digital technology. The theory of Connectivism emphasizes the importance of digital networks and global access to information, allowing students to learn through social and digital connections. Humanism focuses on developing individual potential, emotional well-being, and personalized learning. Cognitivism highlights mental processes in information processing, reinforced with technology that helps students manage and store information effectively.
Meanwhile, Constructivism emphasizes experiential learning and social interaction, which is realized through collaborative tools and virtual simulations in the digital era. This study integrates findings from the relevant literature to provide a comprehensive perspective on how these theories complement each other and can be optimized in a digital-based education system. The conclusion of this study underscores the importance of combining the best aspects of each theory to create an adaptive, flexible, and student-centered learning approach to face the challenges of education in the digital age.

Keywords: Modern Educational Theory, Cognitivism, Humanism, Cognitivism, Constructivism, Digital Age

INTRODUCTION

The rapid development of digital technology has brought significant changes in the world of education. The digital age offers a wide range of conveniences and accessibility that allow students to learn more flexibly and connectedly. In this context, it is essential to understand how the modern educational theories of Connectivism, Humanism, Cognitivism, and Constructivism shape a practical and relevant learning process for students in the 21st century.

[1] explains that the theory of Connectivism introduced by George Siemens and Stephen Downes emphasizes the importance of digital networks in learning. In an era whole of online information and resources, students are not only learning from teachers or textbooks but also from connections and collaborations with global sources connected through the internet [2], [3]. Knowledge no longer belongs to the individual but is spread across the network [4], and learning becomes a process of connecting points of information from various sources [5].

Meanwhile, [6] explains that Humanism Theory offers a student-centered outlook, focusing on their emotional and social needs. In the digital era, personalization in education has become easier by using technology to adjust learning according to individual interests, needs, and potential. Students are encouraged to achieve self-actualization with the freedom to choose the resources and learning methods most relevant to them [7], [8].

In Cognitivism theory, mental processes such as processing, storing, and managing information are

central to learning [9]. Digital technology supports this process by providing tools for students to manage and organize information more effectively [10]. E-learning platforms, mind-mapping apps, and other digital tools are essential in helping students better understand and retain knowledge [11].

Conversely, Constructivism emphasizes that students build knowledge through interaction with the environment and hands-on experience [1]. In the digital age, this approach is reinforced through project-based learning, virtual simulations, and online collaboration, where students can learn through more dynamic and interactive experiences [12], [13].

This study aims to review the existing literature regarding applying these modern educational theories to the student learning process in the digital era. By combining the views of these four theories, this research is expected to provide deeper insights into how technology can be integrated with pedagogical approaches to create more effective and adaptive learning for today's students.

RESEARCH METHODOLOGY

The stages in this study are designed to provide a systematic and structured approach to literature review-based research, focusing on the application of modern educational theories in the context of student learning in the digital era. The first step in implementing this writing is to conduct a literature review related to the theories of Connectivism, Humanism, Cognitivism, and Constructivism in education. They are collecting relevant literature about the learning process in the digital age and establishing four educational theories as the main theoretical framework to be reviewed in the context of learning in the digital era.

Data for this research was collected from journal articles, books, research reports, and academic papers that discussed these theories and their application in digital education. Focus on literature published in the last 10-15 years to gain up-to-date insights into education in the digital age. Source references are obtained by accessing academic databases such as Google Scholar, ScienceDirect, and SINTA for quality literature. In the classification and analysis of literature, literature will be grouped based on four theories of education: Connectivism, Humanism, Cognitivism, and Constructivism [14], [15]. Analyze how each theory is applied in the context of digital learning. Then, thematic analysis is carried out by identifying critical themes from the literature, such as learning personalization, digital collaboration, information management, and the role of technology in facilitating experiential learning.

This study also uses a Comparison of Theories to analyze the similarities and differences between the theories of Connectivism, Humanism, Cognitivism, and Constructivism in their application in the digital environment. It identifies the advantages and limitations of each theory in the context of digital learning. For the synthesis of findings, this study integrates the analysis results to provide a comprehensive view of the application of modern educational theories in the digital era. The Holistic Learning Model is used to compile a model or framework that combines the best aspects of each theory to create a more adaptive and relevant learning approach in the digital age. Analyze this research with validation and review. A peer review is carried out to ask colleagues or experts in digital education to provide input on the research report before publication, and a revision is done to integrate feedback from the review to improve the report.

RESULT AND DISCUSSION

Result

Modern education is an approach in the education system that focuses on developing students' skills, knowledge, and character by utilizing technologies, innovative techniques, and methods relevant to today's society's needs. Modern education differs from traditional education because it is more flexible, interactive, and student-centered, where learners play an active role in learning. Modern education aims to prepare students for increasingly complex and dynamic global challenges, emphasizing the formation of relevant skills, the development of individual potential, and the use of technology as a learning support tool.

Theories that Support Modern Education. Some of the learning theories that are the foundation of modern education include:

1. **Constructivism:** This theory emphasizes that individuals build knowledge through interaction with the environment. Learners not only receive information but also develop their understanding. Constructivism theory in modern education is an approach that states that learning is an active process in which students build their wisdom and knowledge through experience, reflection, and interaction with the environment. In this theory, students are not passive recipients of information conveyed by teachers but active learners involved in creating meaning.

The following is a complete explanation of Constructivism Theory in Modern Education;

Table 1. Elements of Constructivism Theory in Modern Education

ꜜpects	**Explanation**
Definition	A theory that states that knowledge is actively built by students through experience and interaction with the environment.
Expertise	Jean Piaget and Lev Vygotsky.
Student Role	Students are active learners who engage in learning by building their own understanding of experiences and reflections.
The Role of Teachers	As facilitators and supervisors, teachers help students find answers and solutions independently by providing temporary direction and support (scaffolding).
Learning Methods	Problem-Based Learning: Students face real problems that need to be solved through research and discussion. Inquiry Learning: Students formulate questions and seek answers independently through exploration.
Core Concepts	Progressive Development Zone (ZPD): The distance between students' ability to work independently and with teacher or peer guidance. Scaffolding: Temporary assistance provided by teachers to support students until they can be independent.
Collaborative Approach	Encourage collaborative learning where students exchange ideas and work in teams to understand the material more deeply.
Implementation Examples	Flipped Classroom: Students learn theory at home and practice or discuss material in class with teacher guidance. Project-Based Learning: Students work on relevant projects to apply knowledge.
Technology in Constructivism	Use interactive digital tools, simulations, and technological devices to support students' independent exploration and experimentation.
Advantages	Increase student engagement and participation: Students who are more active in learning feel more responsible for their education. Develop critical thinking, problem-solving, and collaboration skills. Constructivist learning helps students develop essential skills such as critical thinking, collaboration, creativity, and communication. Learn more profoundly and relevant to real life. By relating learning to personal experiences and real-world problems, students are more likely to have a more profound and meaningful understanding.

Table one summarizes the various vital elements of constructivism theory in modern education, including the role of teachers and students, learning methods, and the advantages of this theory in the educational process. Constructivism theory offers a more dynamic and relevant approach to modern education by focusing on the active role of students in building knowledge. It supports using methods that encourage critical thinking, collaborative learning, problem-solving, and tailoring education to the evolving needs of individuals and societies.

2. **Cognitivism**: The theory of Cognitivism in modern education is an approach that focuses on how individuals process, store, and manage information. This theory seeks to understand how the human mind works in learning something, emphasizing mental processes such as attention, memory, and problem-solving. In contrast to behaviorist theories that focus more on observable behaviors, Cognitivism highlights the importance of internal structure and mental activity in learning. This theory focuses on cognitive processes that occur in individuals during learning, such as attention, memory, and problem-solving.

   The following is an explanation of the Theory of Cognitivism in modern education;

Table 2. Elements of Cognitivism Theory in Modern Education

Aspects	**Explanation**
Definition	Cognitivism theory focuses on internal mental processes such as thinking, memory, and problem-solving in the learning process.
Expertise	Jean Piaget, Jerome Bruner, Lev Vygotsky, and Robert Gagné.
Key Principles	Learning occurs when students process new information and connect it with existing knowledge. The information is processed through working memory and then stored in long-term memory.
Student Role	Students play an active role in processing information, organizing, and associating new knowledge with existing schemas.
The Role of Teachers	Teachers are designers of learning environments that help students understand information by organizing it logically and systematically.
Learning Process	Attention: Capture students' attention to focus on the material. Memory: Information is processed in working memory and stored in long-term memory. Problem Solving: Students are encouraged to think logically and analyze problems.
Learning Methods	Chunking: Break down information into small units for easy understanding. Modeling: Teachers show the steps of the learning process. Elaboration: Connecting new information with existing knowledge.
Learning Approach	Flipped Classroom: Students learn primary material at home and use class time for problem-solving and discussion. Visual Presentation: Use concept maps, diagrams, and visualizations to organize information.
The Role of Technology	Technology supports the presentation of information in a more interactive and structured manner, for example, through e-learning or computer-based learning applications.
Cognitive Strategy	Distributed Practice: Learn at separate times. Scaffolding: Providing temporary assistance until students can study independently. Concept Map: Organizes information in diagrams for easy understanding.
Advantages	Improving students' understanding of their learning process. Develop critical thinking and problem-solving skills. Encourage the development of metacognition skills (thinking about how to learn).
Differences with Other Theories	Behaviorism: Cognitivism focuses on mental processes, while behaviorism focuses on observable behaviors. Constructivism: Cognitivism focuses on information processing, while Constructivism emphasizes the active construction of knowledge.

Table two summarizes the essential elements of the Cognitivism Theory in modern education, including the main principles, learning methods, the role of technology, and cognitive strategies applied in the learning process. The theory of Cognitivism in modern education provides a deeper approach to how students understand, process, and manage information. Its focus on internal mental processes, such as memory and problem-solving, makes it relevant to education and seeks to maximize students' overall understanding. Teachers play an essential role in creating a learning environment that supports information management and helps students understand how they learn.

3. **Humanism**: Humanism theory in modern education is an approach that puts students at the center of the learning process, focusing on the development of individual potential, freedom, and self-expression. This approach emphasizes the importance of emotional, social, and psychological needs in the learning process and sees students as individuals who have the freedom to choose, develop their potential, and achieve self-actualization. This theory emphasizes the potential and uniqueness of each individual. Learning must pay

attention to the emotional and social aspects of students.
The following is a more detailed explanation of the Theory of Humanism in the context of modern education.

Table 3. Elements of Humanism Theory in Modern Education

pects	**Explanation**
Definition	Humanism theory focuses on the holistic development of individuals, paying attention to intellectual, emotional, social, and moral aspects of education.
Expertise	Abraham Maslow, Carl Rogers, and Malcolm Knowles.
Key Principles	Putting students at the center of the learning process. Learning aims to help students reach their full potential and self-actualization. Meeting students' emotional and social needs as the basis for learning success.
Student Role	Students take on the role of autonomous individuals who are free to choose, develop interests, and take responsibility for their learning.
The Role of Teachers	Teachers act as facilitators and mentors, supporting students' emotional and intellectual development and creating an inclusive learning environment.
Learning Methods	Student-Centered Learning: Focus on students' interests and needs. Self-Reflection: Students reflect on their experiences and evaluate personal development.
Philosophy Humanism	Self-Actualization: The ultimate goal of education is to help students reach their highest potential. Intrinsic Motivation: Learning is driven by students' desires, not external factors.
Supporting Theories	Maslow's Hierarchy of Needs states that a student's basic needs must be met before reaching a higher level of learning. Rogers' theory: The importance of empathy and warm relationships between teachers and students.
Applications in Modern Education	Project-Based Learning: Students explore topics based on their interests. Inclusive Education: Creating a supportive learning environment for every student.
Advantages	Improve students' emotional and social well-being. Humanism education helps students develop emotional well-being, increase self-confidence, and face life's challenges. Encourage intrinsic motivation and creativity. Humanism theory, which focuses on students' interests and autonomy, helps increase intrinsic motivation and creativity in learning. Enable learning that is meaningful and relevant to students' needs. As students learn based on their interests and needs, learning becomes more relevant and meaningful, resulting in a deeper understanding.
Role in Modern Education	The humanism theory supports the development of student-centered learning, allowing flexibility, autonomy, and attention to students' emotional well-being.

Table three summarizes essential aspects of Humanism Theory in modern education, including its fundamental principles, the role of students and teachers, learning methods, and its application in contemporary education. The Humanism theory in modern education emphasizes the importance of student-centered learning by paying attention to their emotional and social needs. Education is seen as a process of knowledge transfer and a means to help students achieve self-actualization and personal well-being. With the teacher's role as a facilitator and mentor, students are encouraged to explore their interests, develop their full potential, and learn in a way that best suits their needs.

4. **Cognitivism**: Connectivism theory is a learning theory that develops in the digital age and focuses on how knowledge is distributed across human and technology networks. This theory was introduced by George Siemens and Stephen Downes in the early 2000s, emphasizing that learning occurs through connections between points of information that can be accessed digitally, such as the internet, social media, and online communities. In modern education, connectivism highlights the importance of developing students' ability to discover, process, and share information from various ever-changing sources. This theory is relevant to the

digital age, emphasizing connected learning through networks and technology. Knowledge is obtained not only from formal sources but also from various online sources.

The following is an explanation of the Theory of Connectivism in Modern Education.

Table 4. Elements of Connectivism Theory in Modern Education

pects	**Explanation**
Pengertian	This theory focuses on how knowledge is acquired through human and technology networks. Knowledge spread across the network.
Expertise	George Siemens and Stephen Downes.
Key Principles	Knowledge is distributed across multiple sources, including digital networks. Learning occurs through connections between information nodes. Learning is the process of building and maintaining an ever-changing network of knowledge.
Student Role	Students are active information seekers who can access, analyze, and connect various digital information sources.
The Role of Teachers	Teachers are facilitators who help students develop networking skills, evaluate information, and use technology to learn.
Learning Methods	Network-Based Learning: Students learn through online platforms, social media, and digital communities. MOOCs (Massive Open Online Courses): Large-scale online learning that provides global access to knowledge.
Key Skills	Digital Literacy: Able to assess, manage, and verify online information. Virtual Collaboration: Collaborate with others through digital platforms. Adaptation and Knowledge Management: Able to keep up with rapid information developments.
Applications in Education	Online Learning Platforms: Moodle, Coursera, Khan Academy, etc. Digital Learning Community: Online discussion forums and social media for learning.
Applications in Modern Education	Project-Based Learning: Students explore topics based on their interests. Inclusive Education: Creating a supportive learning environment for every student.
Advantages	Global access to a wide range of information and resources: Students can learn from various sources and communities worldwide, overcoming geographical and physical limitations. Flexible and continuous learning: Students are not limited to a specific learning time and place. They can continue to update their knowledge according to technological and information developments. Development of 21st-century skills, such as digital literacy and problem-solving; Connectivity develops essential skills, such as digital literacy, virtual collaboration, problem-solving, and quick decision-making abilities.
Challenges	Information Overload: Because information is so abundant in the digital age, students can feel overwhelmed by the multitude of resources available. They must learn to filter out relevant and valuable information. Source Credibility: Students must have the skills to distinguish between accurate and invalid or incorrect information.

Table four summarizes the essential elements of the Connectivism Theory in modern education, including the main principles, the roles of students and teachers, learning methods, skills developed, and the advantages and challenges faced. The theory of connectivism teaches that learning in the modern era does not only occur within the individual but also through external networks involving technology and collaboration. Students play the role of active information seekers who build a knowledge network by accessing and utilizing existing digital resources. In modern education, connectivity provides the foundation for developing digital literacy skills, global collaboration, and adapting to ever-changing information.

Discussion

Modern education is a learning system that continues to develop and adapt to the demands of the times. In contrast to traditional education, which is more rigid and teacher-centered, modern education emphasizes 1) Holistic Student Development [16]: Not only focuses on cognitive aspects (knowledge) but also on affective (attitude) and psychomotor aspects (skills). 2) Active Learning [17]: Students are encouraged to participate in learning rather than passively receiving information actively. 3) Utilization of Technology [18]: Information and communication technology (ICT) is integrated into the learning process to enrich the learning experience. 4) Focus on 21st Century Skills [12], Such as critical thinking, creativity, communication, collaboration, problem-solving skills, and Student-Centered learning: Learners become the main subjects in learning, with teachers acting as facilitators.

In its application, four theories have developed and are considered the basis of thinking in modern education; these four theories Constructivism, Cognitivism, Humanism, and Connectivism—play an essential role in contemporary education in the digital era by offering complementary approaches:

- Constructivism and Connectivism emphasize active and collaborative learning through technology, both socially and digitally [19].
- Cognitivism supports mental processes and information management, which are crucial in a data-rich digital environment [20].
- Humanism encourages personalization and holistic development, allowing students to learn according to their needs and interests through access to various digital tools [21].

With the application of technology in education, these theories create a more flexible, adaptive, and student-centered learning environment, allowing for more immersive, relevant, and sustainable learning [22]–[24]. The following explains the relationship between constructivist theory, Cognitivism, humanism, and connectivism in its application in modern education in the digital era.

Table 5. The Relationship between Constructivism Theory, Cognitivism, Humanism, and Connectivism

Theory	Key Principles	Relationship with Modern Education in the Digital Era	Linkages to Other Theories
Constructivism	Students build knowledge through experience and social interaction [25].	Technology enables project-based learning, flipped classrooms, and collaboration through digital tools such as Google Docs, Zoom, etc.	• Connecting with Connectivism: Learning based on digital and social interaction through networks [26]. • Related to Cognitivism: Students must organize the information gained through experience [27].
Cognitivism	Learning is a mental process that involves processing, organizing, and storing information [1].	Digital tools such as concept maps, mind-mapping apps, and adaptive learning platforms help students organize and process information [28].	• Supporting Connectivism: Digital literacy and the ability to filter relevant information in the digital environment [29]. • Supports Constructivism: The learning process requires information processing to build knowledge [30].
Humanism	Focus on holistic individual development, freedom of learning, and emotional well-being [31]	Technology enables personalized learning, where the learning platform is tailored to students' needs, learning styles, and interests [32].	• In line with Connectivism: Providing freedom for students to explore knowledge from various sources [33]. • Supporting Constructivism and

			Cognitivism: Personalized learning based on active information processing and exploration [34].
Cognitivism	Knowledge is distributed through networks, and learning occurs by building connections between sources of information [35].	Network-based learning (MOOCs, social media, digital communities) allows students to learn globally and collaboratively [36], [37].	• Connecting with Constructivism: Learning through social interaction on digital networks [38]. • Related to Cognitivism: Digital information processing to build knowledge networks [39]. • Supporting Humanism: Giving students the freedom to build a learning network according to their interests [40], [41].

Table five summarizes the relationship between the four theories in the context of modern education in the digital era. It highlights the main principles, the application of technology, and their interrelationship in creating a holistic and complementary approach to learning. The relationship between Constructivism Theory, Cognitivism, Humanism, and Connectivism in modern education in the digital era is a complementary framework that complements each other in learning approaches. Each theory contributes to understanding how students learn, with a different focus. Still, together, they play a role in more effective and relevant learning in the digital age.

Constructivism Theory: Active and Collaborative Learning

- Relationship to Modern Education in the Digital Age: Constructivism emphasizes that students build their knowledge through hands-on experience and social interaction [42]. In digital education, this is implemented through project-based learning, flipped classrooms, and collaborative tools such as Google Docs or online learning platforms. Students play an active role in exploration and collaboration, creating meaning from the material they learn with the help of technology [43], [44].
- Relationship with Other Theories: Constructivism is closely related to Connectivism, where students can build their knowledge through digital networking and collaboration [45]. With technology, Constructivism encourages broader social engagement, facilitating problem-based learning and interaction through digital communities [46].

Cognitivism Theory: Mental Processes and Information Management

- Relationship to Modern Education in the Digital Age: Cognitivism focuses on how students process, remember, and understand information [20]. In a digital context, this theory is applied through information management tools, such as digital concept maps, mind-mapping applications, or adaptive learning platforms that organize information according to student's level of understanding [47].
- Relationship with Other Theories: Cognitivism favors Connectivism because, in the digital age, fast and efficient information management and processing are essential [48]. Cognitivism is also related to Constructivism, as students need to understand and process information to build new knowledge. Technology allows for faster information processing, where students can access materials digitally and organize them meaningfully [49].

Humanism Theory: Holistic Development and Learning Autonomy

- Relationship to Modern Education in the Digital Age: Humanism puts the individual at the center of the learning process, focusing on self-potential, intrinsic motivation, and emotional well-being [50]. In the digital age, humanism is applied through personalized learning, where technology allows students to learn according to their needs, interests, and learning styles. Digital learning platforms

can be tailored to individual preferences, while students can explore the material according to their interests [51]–[53].

- Relationship with Other Theories: Connectivism favors humanism by allowing students to access and explore knowledge from various sources [15]. Constructivism and Cognitivism are also aligned with humanism, as an active and personalized learning process allows students to develop themselves to their potential [54].

Connectivism Theory: Learning Through Digital Networks

- Relationship to Modern Education in the Digital Age: Connectivism, born in the digital age, focuses on how students build knowledge through connections with various digital information sources [42]. Learning occurs through online networking and collaboration. Students can connect with global resources, discussion forums, MOOCs, or the wider learning community via the internet, making learning not limited to physical classrooms [55], [56].
- Relationship with Other Theories: Connectivism is strongly related to Constructivism constructivism, as both emphasize active learning through social interaction [1]. Technology connects students with various sources and expands their knowledge network. Connectivism is also related to Cognitivism regarding information management, as students need to filter, evaluate, and process information from various digital sources [11].

While it offers many benefits, modern education also faces several challenges, such as:

- Unequal opportunities [57]: Not all learners can access technology and learning resources equally.
- Rapid Change [58]: Curriculum and learning methods must be constantly updated to keep up with the times.
- Role of Teachers [59]: Teachers must be competent to apply modern learning methods.

Modern education is a new paradigm that aims to prepare students to become productive, creative, and capable of facing future challenges. By understanding the theories underlying modern education, we can better appreciate the importance of this educational transformation.

CONCLUSION

The four modern educational theories of Connectivism, Humanism, Cognitivism, and Constructivism offer complementary approaches to guiding the student learning process in the digital era. Each theory emphasizes essential aspects of learning and helps shape a more dynamic, flexible, and student-centered model of education, especially in the context of rapidly evolving technology. 1) Connectivism emphasizes that learning occurs through digital and social networks, where students are globally connected to various sources of knowledge. It facilitates comprehensive access to information and encourages cross-border collaboration, making students active knowledge builders in an ever-changing digital environment. 2) Humanism highlights the importance of personalization and student well-being in learning. With technology, learning can be tailored to individual needs and interests, providing greater autonomy for students to explore and develop their full potential. This approach ensures that students' emotional and social development is also handled. 3) Cognitivism focuses on how students process, store, and manage information. In the digital era, technology helps speed up and simplify information management through interactive tools such as information management applications and adaptive systems. Students learn more effectively with logical structures and cognitive techniques such as concept maps and mind mapping. 4) Constructivism encourages students to build knowledge through hands-on experience and collaboration. Technology allows for more interactive project-based learning and experiments, so students can learn through real-life activities and collaboration with peers in a virtual environment. Technology is the main link that supports the application of these four theories, making the learning process in the digital era more integrated and responsive to the evolving needs of individuals and society.

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