

ALL ABOUT LEARNING METHODS: PAST, PRESENT AND FUTURE

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Article Info

Article history:

Received August 02, 2023

Revised September 20, 2023

Accepted September 25, 2023

Keywords:

Learning Methods;

Past;

Present;

Future

ABSTRACT

Learning methods play a vital role in instructional pedagogy. Different learning methods are available that are being used according to the learning environment and educational levels. The objectives of this review study were to discuss the different past, present, and future learning methods. The past learning methods consisted of traditional learning methods, discussion learning methods, and module-based learning. The present learning methods consist of flipped learning methods, online learning methods, digital game-based learning methods, blended learning methods, project-based learning methods, inquiry-based learning methods, case-based learning methods, problem-based learning methods, and concept-based learning methods. The future learning methods consisted of artificial intelligence-based learning methods. All these methods have been discussed in this review article.

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1. INTRODUCTION

Learning is a fundamental human need. Learning is a practice that involves the transfer of knowledge (Hafeez et al., 2020). The capacity of the teacher to use learning methods, practices, and techniques determines how well a learning strategy is implemented in the classroom. In the modern day, effective learning is crucial for the development of critical thinking abilities (Saira et al., 2020a). In all areas of education, it is crucial for students' skills and cognitive growth. Modern techniques of learning, including mobile-based learning, digital-game-based learning, and project-based learning, have been made possible by the internet revolution and ICT in the twenty-first century (Saira et al., 2020b).

The many techniques employed by a teacher to give lectures to students based on predetermined instructional objectives or by learners to meet their learning requirements are represented by the learning method (Hafeez, 2021a). According to Omar et al. (2020), the primary goals of learning methods are to assist learners in acquiring,

retaining, and applying information, developing habits and attitudes, increasing information stores, and understanding the basic rules and principles of subject matter.

Psychologists created many learning techniques and strategies based on the cognitive domain of learners and learning settings in order to attain the cognitive domain of learning of the learners (Hafeez & Akhter, 2021). The advancement of several educational sectors depends heavily on these teaching strategies (Ajmal et al., 2021). The cognitive domain of learning underpins the learning approaches that promote active learning. Learners must actively participate in the actions of the teacher (Saira et al., 2021).

The most difficult task in education is choosing appropriate and effective teaching strategies that will help students improve their critical thinking abilities and make learning meaningful (Hafeez, 2021b). The instructor's technique and the student's active participation in the learning process are two crucial elements in helping students develop their critical thinking abilities (Basit et al., 2021a).

Problem Statement

According to the learning environment and students' abilities, an instructor will teach a student in a variety of ways. A teacher uses a variety of teaching strategies to meet the needs of the students and foster the growth of their critical thinking abilities (Ramzan & Hafeez, 2021). Therefore, the technique of learning is quite important. We thus need to set aside some time to talk about the different teaching techniques.

Objectives of the Study

The objective of this study was to discuss the different learning methods.

REVIEW OF THE LITERATURE

Past Learning Methods

The following learning methods were used in the past and are rarely used at the present time, according to the learning environment and settings.

Lecture/Traditional Learning Method

A traditional teaching approach is one in which a teacher frequently discusses a certain subject or topic in front of a class of students. The number of participants might be anywhere from 20 to 1000. The entire subject matter knowledge must be presented by the instructor. One of the first learning techniques, it is used in a range of areas in schools, colleges, and universities. The lecture method of education relies on the teacher imparting knowledge to the class members before the pupils themselves.

The conventional lecture or teaching technique is another name for the lecture style of training. Given that it is a passive form of learning, many academics and instructors believe that this strategy is not more successful in aiding learners' cognitive development. Students are not able to engage in the educational learning process. The full lecture is often given in front of the students by the professor. After receiving the lecture notes, the students get ready for the test. The main rationale for employing the conventional learning approach is its ability to handle a large number of learners at once (Hafeez et al., 2023a).

Discussion Learning Method

Numerous studies have demonstrated the value of the discussion teaching technique (Saira & Hafeez, 2021). In order to contrast conventional lecture and discussion teaching approaches, Seeley (2017) performed research. The study's findings suggested that using a discussion-based teaching approach is a more successful and valuable teaching-learning technique for enhancing students' communication and critical thinking abilities. According to Nami et al. (2018), the discussion teaching approach is a self-directed, two-way conversation in which the students share their thoughts in order to brainstorm solutions to problems. Numerous research studies, such as Sun and Bin (2018), suggest that innovative learning methodologies, such as small group discussions, allow students to actively engage in the learning process. The learner's critical thinking and cooperative learning skills have improved by using the discussion learning technique.

Module-Based Learning Method

A set of methodical learning exercises based on a curriculum and suited to the abilities that students must attain are known as modules. Since the module comes with its own benefits, students should not rely on the teacher to help them develop the necessary learning skills. Instead, they should use the module to their advantage. The module-based learning method involves pupils learning on their own, autonomously. The students confer with one another on the lesson's content to determine their own objectives. Teachers can use the innovations known as digital modules to address issues with textbooks or government-issued modules. The advancement of IT in schools may be used to carry out these improvements (Hafeez, 2021c).

Making pupils experts in the chosen subject is the goal of module-based learning. The module-based learning process helped students strengthen their critical thinking abilities so they could use various methods to answer the issues that were presented to them in light of what they had learned. Students evaluate their own learning by completing several problem-based tasks in a learning module. The main benefit of module-based learning is that students may use the course materials on their own both within and outside of the classroom. Learning modules improve one's capacity for critical thinking, communication, and self-learning (Alias & Siraj, 2012).

Present learning methods

Flipped Classroom Model-Based Learning

A new instructional learning paradigm called "flipped classrooms" involves the teacher sharing pre-planned digital learning materials with the students using any digital medium outside of class. According to Bergmann and Sams (2012), the adoption of the flipped classroom approach is beneficial since it revisits the way that students learn and enhances their learning results. The pupils become lifelong learners as a result of the flipped classroom paradigm. According to Tomas et al. (2019), using the flipped classroom paradigm enhances student motivation, motivates them, and piques their interest in learning. The use of the flipped classroom model as an alternative to the

standard lecture technique has steadily drawn more attention from academics and teachers.

The development of ICT tools like interactive movies and collaborative classroom activities has made it possible to use the flipped classroom model widely (Iqbal et al., 2021). One of the finest models for learning with technology is the flipped classroom style of education, which is utilized to create an engaging and dynamic learning environment in the classroom. The Flipped Classrooms paradigm, according to several academics, is presently being applied in a number of academic fields, including science and engineering, mathematics education, social sciences and humanities, medical and engineering, and English composition (Long et al., 2017).

Through asynchronous communication, the relevant study material is also distributed to this medium (Ajmal et al., 2022). The classroom is where interactive, dynamic, and collaborative problem-based learning activities are conducted to solve real-life challenges (Qasim et al., 2021). According to research done by Basal (2015), learning outside of the classroom is often done using videos and a learning management system (LMS). Using recently created technology, the professors create films and study materials, upload them to the university's LMS account, and make them accessible both within and outside of the classroom.

Online Learning Method

Online learning has been made possible by the rapid advancement of information and technology. Learners who are studying at a distance are typically able to use computers connected to a network, allowing them to learn at any time and from any location (Hafeez et al., 2021d; Muzaini et al., 2021). Online learning and teaching is a technique for enhancing the learning-teaching process by utilizing a range of student-centered, sophisticated, and even internet-based equipment to deliver learning experiences in a modern or asynchronous setting (Hafeez et al., 2022a).

In a productive learning-teaching environment, students may participate in online lectures, professors and students can communicate directly, and rapid replies are possible. In such a learning-teaching environment, learning resources are not accessible as a live learning process, but they are available in different learning management systems. In such a setting, it is hard to react swiftly and right away (Hafeez et al., 2022b).

The quick advancement of ICT has simplified online learning. The ability to use computers or laptops connected to a network system allows students taking distance education courses to access their lessons at any time and from any location (Basit et al., 2021b). Online learning is considered a strategy that provides the learning experience in a contemporary and asynchronous setting in order to promote learning using a range of learner-centered, creative, and even internet-based instruments (Hafeez et al., 2023b). Direct communication between teachers and students, online study and lectures, and rapid feedback on online learning are all made possible by an effective and efficient environment. In contrast to how they are readily available in many learning management systems during face-to-face learning procedures, learning resources are not instantly accessible in such a learning environment. Online education must be promptly changed; therefore, under these thrilling circumstances, Google products like Open Board,

Google Hangout, Calendar, G-Drive, Google Form, and Gmail are unquestionably helpful. Face-to-face instruction can be replaced by the effective and successful use of this program (Basilaia & Kvavadze, 2020).

Digital Game-Based Learning Method

A contemporary method of teaching where students learn while having fun is game-based learning. Students are motivated by digital game-based learning, which also helps them study with complete focus and interest. By embracing the difficulties presented throughout the game, students participating in digital game-based learning are encouraged to explore, be creative, communicate, and visualize. The learners must overcome several obstacles during the digital game process, including completing a methodical, well-designed, complicated task and competing with their peers. Students are more motivated and capable of learning thanks to this competition, and they can easily accomplish their objectives. The popularity of learning through digital games has also spread to mobile technologies as a result of the rapid growth of ICT (Hafeez, 2021e; Bakhsh et al., 2022).

Blended Learning Method

The notion of blended learning entails the use of information and communication technologies in a variety of teaching approaches across a range of subject areas. Numerous studies have been conducted on its efficacy in subjects ranging from elementary school to higher education (Hafeez et al., 2023b), and it has emerged as one of the most dynamic teaching strategies.

According to Lu et al. (2018), blended learning is supported by several colleges and institutions across a range of fields due to its favorable effects on students' academic attainment and critical thinking abilities. According to Farashahi and Tajeddin (2018), the main goal of blended learning is to provide learners with a platform that is tailored to their requirements, learning styles, and competencies. To find out how students felt about the use of blended learning, Erdem et al. (2014) conducted a study. The results of the study showed that learners are enthusiastic about blended learning.

Inquiry-Based Learning Method

Active learning methods like inquiry-based learning encourage students to investigate new concepts and pose questions. According to Pedaste et al. (2015), this kind of teaching aids in the development of students' critical thinking, problem-solving, and research abilities. Through investigation and challenging questions, students are kept interested in their learning through inquiry-based learning. It is a method of teaching that promotes students' participation in experiential learning and problem-solving (Ernst et al., 2017).

Active learning techniques like inquiry-based learning begin by offering questions, dilemmas, or scenarios. It stands in contrast to conventional education, which often focuses on the instructor conveying information and their subject-matter expertise. Instead of using a lecturer, a facilitator frequently supports inquiry-based learning. To acquire information or find answers, inquirers will identify and investigate problems and questions. Problem-based learning is a component of inquiry-based learning, which

is typically used for smaller-scale research projects and studies. According to [Khalaf and Mohammed Zin \(2018\)](#), the development and practice of thinking and problem-solving abilities are primarily tightly tied to inquiry-based education.

Project-Based Learning Method

Working on a project for a certain length of time helps students strengthen their critical thinking and communication abilities. This kind of learning is known as project-based learning (PjBL). Through group discussions, project-based learning offers many possibilities for students to improve their communication and critical thinking abilities. PjBL is the best educational strategy since it helps students build communication skills, knowledge, and critical thinking abilities, as well as other learning outcomes that are crucial for enhancing academic performance and long-term learning. PjBL is a method of learning that was created for complicated and challenging challenges, long-term learning activities, transdisciplinary assignments, and goal-oriented learning. Numerous studies' findings indicated that the project-based learning method had an impact on students' learning outcomes and critical thinking abilities ([Hafeez, 2021e](#); [Muzaini et al., 2022](#)).

Case-Based Learning Method

Case-based learning (CBL) is a dynamic strategy that builds conceptual knowledge in students in order to enhance their critical thinking and communication skills via questioning, discussion, and sharing of the outcomes of individual cases ([McLean, 2016](#)). The challenge is offered at the outset of the lesson in the CBL technique to psychologically prepare students to address complicated real-life situations. The CBL teaching technique, which is used across many disciplines, strives to promote active learning by applying students' theoretical knowledge to real-world circumstances.

Science education, business, medicine, law, and the health sciences all make extensive use of CBL. By resolving case-based, real-world challenges, students may apply the information they have learned in the classroom and explore new knowledge as part of the case-based learning strategy. The classroom instructor plays a crucial role in CBL by assisting the students in converting their theoretical knowledge into practical knowledge as they work through a variety of case-based, complicated challenges ([Li et al., 2018](#)).

The case-based learning technique is a crucial teaching strategy in the clinical sector because it enables students to actively engage with real-world issues and create their own knowledge-based products. Instead of relying solely on the information that their lecturers or textbooks provide in class, students using the CBL technique can create their own answers. CBL is an active learning strategy since it involves the students and develops their communication and critical thinking abilities. It is especially advantageous for children who perform poorly in school. Many clinical and medical-based fields employ CBL as a long-term educational conceptual framework to answer case issues ([Hafeez, 2021c](#)).

Problem-Based Learning Method

According to definitions, problem-based learning is a method of learning that involves identifying, analyzing, and solving issues. In contrast to the traditional lecture technique, problem-based learning (PBL) is an active learning strategy in which students are provided with challenging and complicated tasks that must be solved (Muzaini et al., 2022). In the problem-based learning approach, the instructor serves as the facilitator. The problem-based learning strategy puts the emphasis on the learner and challenges them to solve a problem using their prior knowledge while also learning something new.

The PBL is the most cutting-edge learning strategy yet devised. PBL is a method of learning that is helpful in the development of science learning abilities (Hasbi & Fitri, 2023). For more than 30 years, the problem-based learning method has been used successfully in a variety of educational settings. A pedagogical learning strategy centered on engaging students is problem-based learning. There are several ways that technology may be used in problem-based learning. The first is integrating PBL with technology for online or remote learning, and the second is using it with multimedia to administer the learning system. The integration of technology into problem-based learning (PBL) aids students in improving their learning abilities and conceptual understanding of real-world issues (Hafeez, 2021c).

Demonstration Learning Method

Giving a demo or carrying out a particular action or notion is what is meant by the term demonstration method in educational contexts. In other words, the demonstrative approach is a very methodical teaching and learning procedure. When students struggle to relate theories to real-world situations or are unable to comprehend how to apply theories, demonstration is frequently used (Hafeez, 2021c).

In order to ensure the demonstration method is a success, three things need to be followed:

- The shown item shouldn't be too tiny when using the demonstration approach.
- Clear and straightforward language should be utilized throughout the demonstration approach so that students may readily comprehend the topics.
- To solve their problems, the students should be allowed to ask the teachers.

Concept Map Learning Method

The main objective of education in the twenty-first century is to help students produce useful and relevant information that can be used to create and resolve problems in the real world. With all of the challenges that the world presents, such as the rapid advancement of knowledge and learning techniques and the rising demands on the educational system, students must strengthen their learning abilities in order to keep up with these challenges. As a result, the main objective of curriculum in schools, colleges, and universities is to foster the theoretical and conceptual learning that serves as the foundation for students' growth (Hafeez, 2021f).

Concept mapping techniques demonstrate how students learn and apply information to real-world problems. Additionally, idea maps assist students in assimilating the content presented at their cognitive level. Concept maps are two-dimensional graphics that display data. Technology-based concept maps are being used in the teaching and learning process. Concept maps may be used as tools to encourage connections between designs inside and across contexts, which can speed up the processes of knowledge integration and learning. Nodes, two directional joining lines, and connecting tags that specify the connections between nodes make up an idea map. According to [Schroeder et al. \(2018\)](#), a concept map is made up of two nodes connected by a described line.

Future learning methods

Artificial Intelligence-Based Learning Methods

Artificial intelligence is the new horizon being used in various fields of life, including education ([Hafeez et al., 2023c](#)).

Concept of Artificial Intelligence

John McCarthy coined the term artificial intelligence (AI) for the first time in 1955 to describe a computer system that has the capacity to carry out a variety of cognitive tasks similar to those completed by humans, such as communication, decision-making, learning, and problem-solving ([Nilsson, 1998](#)). AI is a broad term that covers a variety of technologies and algorithms, according to [Smith \(2019\)](#). Early AI in education frequently focused on intelligent teaching systems designed to solve problems on their own, such as improving operator competency.

Artificial Intelligence in Education

Machine Learning

Machine learning is largely based on the idea of knowledge discovery, which requires looking through sample datasets known as "training data" to find important patterns and structured information. For instance, using data from student preferences, ambitions, and prior accomplishments to match them with institutions where their potential may be maximized, machine learning can be used to help students make course and college decisions. Additionally, this technology can help teachers realize how kids are absorbing different subjects.

Based on aggregated student performance data, this knowledge helps teachers modify their teaching strategies, potentially improving students' understanding of the topic. For instance, the ability of machine learning to recognize and anticipate images may be used to evaluate student work and tests quickly and precisely, outperforming human evaluation in both efficiency and precision. It is interesting that the popularity of deep learning, a branch of machine learning, has grown significantly. Decision tree learning, inductive logic programming, clustering, reinforcement learning, and Bayesian networks are a few of the frequently used techniques in the field of machine learning ([Hafeez et al., 2023c](#)).

Learning Analytics

The primary focus of learning analytics is the gathering of information on student characteristics and knowledge entities derived from learner models and knowledge domain models. With this strategy, machine learning is a cutting-edge technology that is being introduced to the non-technical area of education. The main objective is to adapt teaching methods to the talents and requirements of specific students. This could mean providing helpful feedback and educational tools or taking action to help pupils who are in danger.

The field of learning analytics draws its methods from a variety of academic fields, such as the learning sciences, data visualization, machine learning, and semantics. For instance, AI-driven competency-based learning, which gathers crucial student data, is able to predict the key competencies that each student should concentrate on and effectively provide insights about specific students. This proactive approach gives educational institutions the power to decide how best to support their students based on solid information (Hafeez et al., 2023c).

2. CONCLUSION

Learning is a procedure that is related to the transmission of information. Different learning methods are being used to transmit this information. The objective of this review study was to discuss the different past, present, and future learning methods. The review showed that traditional or lecture-based learning methods were used in the past. The present learning methods reviewed were online learning methods, case-based methods, project-based learning, concept mapping learning methods, etc. The future learning methods discussed in this article are artificial intelligence methods.

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