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How to Adapt Teaching and Learning Techniques to Meet Learners' Needs

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Abstract

Adaptive teaching techniques are a personalized approach to instruction that aims to meet the unique needs of individual students. It focuses not only on tailoring instruction to the individual's abilities and learning style but also on promoting a supportive and inclusive learning environment.

Adaptive teaching is an effective and student-centered approach that aims to meet the diverse needs of learners while promoting high-quality teaching.

Adaptive teaching helps create a supportive learning environment where all students feel valued, engaged, and motivated to learn. The primary purpose of adaptive teaching is to ensure high-quality teaching that maximizes student outcomes.

The purpose of the research is to know how adaptive teaching and learning strategies fit learners' needs. It is recognized that every student is unique, and they require specific tailored instruction to reach their full potential. This approach involves using variable teaching and assessment tools to understand student progress and adapt instructional strategies accordingly.

The study was guided by a descriptive survey design. Participants took an online survey that used their responses to compute research-relevant variables. The study hypothesized that students would perceive greater performance by using adaptive effective teaching and learning strategies. Data was collected from 84 respondents including 31 teachers and 53 students. Data was collected using questionnaires in a Google Form survey. Inferential statistics were used to analyze collected data that included bar graphs, percentages, Excel spreadsheets, and correlation. The findings of the study showed that there is a correlation between adaptive effective teaching strategies and the academic performance of the learners, this happens through discussion, using a variety of learning resources, different teaching strategies, different assessment tools, constructive feedback, providing a safe environment, encouraging students' engagement, and integrating modern technology in the learning process. The study therefore concluded that using adaptive effective teaching strategies promotes the academic performance of the students. By implementing adaptive teaching strategies, educators can enhance student outcomes and create a safe environment that supports and motivates the growth and success of all students.

Keywords: *Adaptive teaching and learning**,** Learners' needs, teaching techniques, Academic performance, student outcomes, engagement.*

Introduction

Education is a process by which the personality of a child is developed. Thus, the education of tomorrow should be able to play its role more effectively by making the individual creative, innovative, and effective. One teacher would be unable to cater to the various individual differences of all the students. So, the Kothari Commission Report (1964-66) recommended "The supply of teaching aids to every school is essential for the improvement of quality of teaching. It should indeed bring about an educational revolution in the 21st century." Innovative teaching methods with the latest teaching technologies help the students to achieve their excellence in education.

Modern Teaching Techniques have been spread all over the world, which is useful and easy for teachers. Unlike traditional teaching methodology, modern teaching methodology is much more student-centered which helps the students to be engaged and to interact. *(Wiliam, D.,2011)*

Modern Teaching Technique is important and most preferred in the technological age.

Students differ in their academic needs. Those needs include feeling important and secure in the learning environment, understanding learning goals, having time to integrate learning, understanding the learning process, and receiving feedback.

There are 4 learning styles: visual, auditory, kinesthetic, and reading/writing. Most people are a combination of these four styles, but more times than not, they have a predominant style of learning.

Adaptive learning strategies and various teaching practices are the best ways to improve education processes and find approaches to learners' needs. Assessment tools aid in assessing and evaluating student learning and can provide different options to assess students beyond the traditional exam. Several tools are available including grading, assignments, self-assessment, peer assessment, surveys, etc.

Educational technology makes the teaching process scientific, objective, clear, simple, easy, interesting, and effective. Educational technology gives proper guidance to solve teaching problems. Using modern technology during the learning journey will upgrade communication skills and student achievement.

Study Problem

There are too many things affecting students' attention during the learning process. These factors include misconceptions, insufficient knowledge, interest/curiosity, personal gains, and communication. Teachers should determine their students' needs, knowledge, skills, and experiences. They can design instructions, set, and communicate expectations, and plan strategically to ensure success. Using modern teaching and learning techniques, variable digital and non-digital resources, as well as effective assessment can encourage the students' engagement and improve their outcomes.

Hypothesis

Using adaptive effective teaching techniques, different learning strategies, and variable assessment tools will increase students' success and engagement.

Integration of technology and the use of multiple resources will improve students’ performance and outcomes.

Objectives

1. Identify the Importance of Using Adaptive Teaching for Effective Learning.

2. Understand the Diversity of learners’ Needs in the Technologist Generation.

3. Study the Effectiveness of Using Multiple Resources and Different Assessment Tools in Learning.

4. Discover the Ways to Improve Learners’ Performance and Outcomes.

Importance of the research

This research is a guideline for many educators who want to improve their teaching experience.

It helps educators to plan strategically to understand different student's needs and their learning styles by adapting their teaching techniques.

It provides professional development in the learning process by explaining ways of different assessment tools, integrating technology, and using variable teaching resources in effective ways.

It includes different ways of creating a safe environment and community to enhance students’ engagement and promote their outcomes.

The results showed the degree of students' satisfaction regarding the applied techniques for their learning process. These results can help in further studies.

Basic needs for current education

In today's fast-paced and technology-driven world, students' engagement has become a crucial factor in ensuring effective learning outcomes. It is no longer enough for teachers to simply deliver information; they must actively engage students in the learning process. By implementing proven student engagement strategies, educators can create a positive learning environment that fosters curiosity, critical thinking, and active participation. In this chapter, we will explore some effective strategies that can help boost student engagement and enhance the overall learning experience.

Basic learning needs are those that comprise both essential learning tools (such as literacy, oral expression, numeracy, and problem-solving) and the basic learning content (such as knowledge, skills, values, and attitudes) required for survival, to develop full capacities, to live and work in dignity, to participate fully in development, to improve quality of life, to make informed decisions, and to continue learning. The scope of basic learning needs and how they should be met varies by country and culture, and inevitably, changes over time. *(Jomtien, Thailand, 5-9 March 1990)*

The feeling important and secure in the learning environment, understanding learning goals, having time to integrate learning, understanding the learning process, and receiving feedback. Motivation to learn increased and misbehavior decreased when students perceived these needs were being met in class. *(Isenman, P., 1980)*

How to Meet Learners Needs

One of the greatest challenges teachers face is effectively reaching a roomful of students with varying abilities and learning styles daily. Teachers should be constantly working to develop a curriculum rich enough for all students. Technology is the perfect tool for providing learners of all abilities the opportunity to achieve goals. *(T.H.E. Journal, v32 n10 p20 May 2005)*

The first step to meeting diverse learners' needs is to know who they are, what they bring, and what they need. By knowing the learners, teachers can identify their strengths, interests, preferences, challenges, and goals, and use this information to plan their instruction, differentiation, and support

strategies. By differentiating instruction, teachers can optimize the learning opportunities, outcomes, and experiences for their students, and demonstrate their professional competence and accountability to the learners. *(Wahl, L., & Duffield, J,2005.)*

By adapting the curriculum, teachers can address the diverse learning styles, abilities, backgrounds, and motivations of their students, and meet the standards and expectations of their learners. *(Edwards, R.,2001.).* Teachers should get reflections from learners. By reflecting on their practice, teachers can improve their teaching quality, impact, and satisfaction, and foster a culture of continuous learning and improvement. *(Wahl, L., & Duffield, J,2005.)*

Importance of Adaptation in Education

An adaptation is a change to curriculum, instruction, or testing format or procedures that instruction, or assessments that fundamentally allow a student to demonstrate their abilities. *(Stepanyan, K et al,2009)* Accommodations in the form of adaptations occur when teachers differentiate instruction, assessment, and materials to create a flexible learning environment. Not all adaptations work for all students. Be open to trying new or different ones to address the needs of the students in the class or on the caseload.

Teaching 21st-century students using innovative methods proven to work effectively with today's tech-smart students. Teachers use a variety of strategies to improve student learning, but it is most important to create a comfortable classroom where students feel secure. Student learning is improved when teachers take the time to get to know students, understand their needs, and establish meaningful relationships. These teaching methods used across the globe bring in desired academic results in a quicker time when compared to traditional teaching methods. They need to be understood and implemented correctly. (*Senthamarai, S. (2018)).* Here are some effective strategies that have a positive impact:

- **Cooperative Learning**: "Teamwork makes the dream work."
- **Problem-based learning (PBL)** is a method where open-ended problems take center stage for students to solve.
- **Design thinking** is the process of finding meaningful ideas to solve a particular real-world problem that exists in a community or an organization.

- **Competency-based learning** is a method where students progress through learning objectives at their own pace.
- **Student-centered approach** is all about making learning matter to the students.
- **Differentiated instruction** is another type of teaching method that emphasizes meeting the diverse needs of students in the classroom.
- **Technology-based learning**, also known as e-learning, is a type of teaching method that incorporates technology into the learning process.
- **Project-based learning (PBL)** is a type of teaching method that emphasizes hands-on, real-world experiences and collaborative problem-solving.

The Best Types of Assessment and How to Use Them

Assessment is the systematic basis for making inferences about the learning and development of students. It is the process of defining, selecting, designing, collecting, analyzing, interpreting, and using information to increase students' learning and development**.** Using assessments as feedback for teachers is powerful. This power is truly maximized when the assessments are timely, informative, and related to what teachers are teaching.

Teachers can set up different types of assessments and use their assessment tools to create a plan that guides students through a skill. This adaptive assessment will support students with pre-requisites when they need additional guidance.

- **Diagnostic assessments** will help the teachers to know the students' knowledge and skills about the topics they are going to explain. Diagnostic assessments can also help benchmark student progress.
- **Formative assessments** help teachers understand student learning while they teach and provide them with information to adjust their teaching strategies accordingly. Formative assessments help teachers track how students' knowledge is growing and changing in their classroom in real time.
- **Summative assessments** measure student progress as an assessment of learning. Standardized tests are a type of summative assessment and provide data for teachers, school leaders, and district leaders.
- **Ipsative assessments** are one of the types of assessment *as* learning that **compares** previous results with a second try, motivating students to set goals and improve their skills**.**

- **Criterion-referenced assessments** compare the score of an individual student to a learning standard and performance level, independent of other students around them. (Individual Action Plans).

Benefits and Uses of Technology in Education

Using modern teaching technologies, learners are now able to participate in the activities of learning communities throughout the world. They may learn collaboratively, share information, exchange their learning experiences, and work through cooperative activities in virtual learning communities. Modern teaching technologies facilitate teaching and learning processes more productively.

Modern teaching technologies are restructuring the teaching-learning process to meet international standards. Technology and knowledge would play an important role in our teaching and learning techniques. *(Dr. A.P.J., 2003*). Nowadays, as classes are modified and equipped with modern teaching aids such as Speakers, online streaming videos, interactive whiteboards, visualizers, response systems, CDs, projectors, educational software, etc., they act as tools for the teachers to explain the concepts more effectively and lucidly. Teachers can teach the students with more depth and efficiency and clear all their doubts with modern teaching techniques. Teachers must use various types of modern teaching techniques to connect with the students. *(Hollnagel et al,2013).*

These new technological methodologies can be easily adopted by the new generations of "digital natives." This is due to the easy handling and adaptation to new technologies since this generation grew up with access to the Internet, mobile devices, and social networks. *(Prensky et al, 2001)*

Here are some benefits educators and learners gain from using technology in their classrooms:

- Increased Engagement and Motivation for Learners.
- Improved Communication and Collaboration Between Educators and Learners.
- Greater Access to Educational Resources and Materials.
- Increased Flexibility and Convenience in Course Delivery.
- Enhanced Ability to Personalize and Differentiate Instruction.
- Improved Organization and Management of Class Materials and Assignments.
- Increased Learner Autonomy and Self-Directed Learning.

- Keep Learners Updated with the Latest Advancements
- Increased Multimedia and Interactive Tools for Enhancing Learning Experiences.
- Greater Opportunities for Distance and Online Learning.
- Greater Access to a Variety of Educational Apps and Software.

The Role of Artificial Intelligence (AI) in Learning Process

Artificial Intelligence (AI) is a booming technological domain capable of altering every aspect of our social interactions. AI-enhanced digital technology has played an essential role in our daily lives, with its great power to change the way we think, act, and interact.

In education, AI has begun producing new teaching and learning solutions that are now undergoing testing in different contexts. Applications and tools driven by AI technologies, for instance, intelligent robots and adaptive learning systems, have been increasingly utilized by educators and learners within both K-12 and university contexts.

AI technologies provide opportunities for the realization of personalized learning for learners to meet their individual needs (*Della Ventura, 2017).* Because everyone is independent and has unique learning styles, abilities, and needs, it can be difficult to satisfy every learner by using traditional educational methods. However, with AI, instructors can suit everyone's needs on a case-by-case basis. Thus, learners can be more motivated, engaged, and independent in the process of learning. (*Della Ventura, 2018).* In addition, AI technologies offer chances to support the engagement of learners with learning disabilities. With the increasingly wide application of AI technologies for teaching and learning, instructors are offered chances to get rid of repetitive and tedious tasks and to reply to students timely, thus advancing the adaptive and personalized teaching process (*Chan & Zary, 2019).*

Teaching and Learning Resources

The teaching and learning resources referred to in the guidelines include any spoken, written, or visual text and graphical content or activity used or conducted by schools and teachers such as textbooks, multimedia, applications, software, platforms, games, social media, speeches, digital learning resources including video, audio, text, websites, animations, and images. Teaching and learning resources play a crucial role in the teaching and learning process, leading to improved academic

performance. Additionally, the use of a variety of learning resources has been found to promote academic performance. However, teachers can face challenges in the selection and use of instructional resources, including financial constraints, large class sizes, and insufficient time for preparation. *(Munguti, S.,2017)*

Using resources to support students' learning and development is part of a teacher's responsibility; these resources include materials and services available both through and beyond the school. These materials and teachers' understanding of them are key to ensuring successful learning.

To achieve an active environment and active learning is essential. The meaning of 'Active learning' is such a type of learning in which learners are engaged with the learning materials, fully participate in the class, and work together to seek knowledge. For this, a teacher should create a learning-friendly environment for learners. These things can be ensured using learning resources in the classroom.

A Chinese proverb "What I hear, I forget; what I see, I remember and what I do, I understand". To attain remembering and understanding of the content, teaching-learning resources are needed.

Teaching-learning resources are important as follows:

- In the teaching-learning process, when a teacher uses these resources, learners use more than one sense organ. Uses of more sense organs makes learning permanent because these resources help to develop the proper mental image.
- Through teaching-learning resources, the teacher clarifies the content more easily.
- Teaching-learning resources make available direct experience to the learner which is helpful in learning.
- Interest is related to motivation and motivation is essential for learning. The teaching-learning resources make the environment interesting for the learners.
- In teaching, illustration with examples makes learning very successful. Teaching-learning resources provide an absolute picture of conceptual thinking.
- Teaching-learning resources are also helpful in increasing the vocabulary of the learners.
- Teaching-learning resources also remove dullness from the classroom and make the classroom lively and active.

Criteria for Selecting and Integrating Resources in Teaching and Learning

The selection and integration of teaching-learning resources is a central part of the process of learning activity. The selection of these resources is as important as content selection is important. Teachers must ensure that the teaching-learning resources that they are going to present in the classroom, are appropriate for the learners and that these are going to positively affect the growth and development of the learners. All learners have their unique characteristics. So, teachers must be prepared and equipped to cater to a variety of individual needs of learners. Not only the selection of these resources is important, but also the integration and use of these materials is important. Before the selection and integration of teaching-learning resources, teachers should ensure the objective of the curriculum/content and expected outcomes. As per objectives, the learning resources should be selected. The certain criteria according to which the teaching-learning material should be selected are as follows:

- Teaching-learning resources should directly focus on ideas and essential questions of the content/curriculum. Teachers should make sure that the selected resources present the correct concept and picture of the curriculum.
- The teaching-learning materials should make the learners thoughtful, and reflective, and it should build a high level of skills among them.
- Resources should be related to learners' knowledge and needs.
- Teaching-learning resources should be geared as per the different abilities, requirements, and areas of interest of the learners. It should support the inclusive curriculum.
- Teaching-learning materials should encourage interdisciplinary connection. In this condition learners can correlate it with other subjects and in a broader sense learners will be able to apply it not only in the classroom condition but also in the real world.
- Teaching-learning resources should be related to all learning domains of the learner (cognitive, affective, and psychomotor). It should also be related to different levels of these domains.
- During the selection of teaching-learning material teachers should keep in mind the family background and living environment of the learners.
- Resources should be according to the age of the learners for whom they are selected.
- Teaching-learning materials should include valid and mixed assessments as conventional and performance-based.

- Teaching-learning resources should be grammatically correct. Language clearness is also one essential aspect of resources.
- The teacher should do the lesson planning first and fix the place for certain resources. In the absence of planning, the resources can’t be meaningful.
- If teachers are using any online method as a resource, there should be filtration for a few sites.
- To make learners active in the classroom there should not be any boredom. So, teachers should integrate/arrange resources in such a manner that the class is not dull.
- Before using the resources if it is necessary to document, editing should be done by the teacher. Manipulation should be done by the teacher.
- Teachers are the best resource so if there is any lack of any resource, teachers should try to fill it with their efficiency.

Research Methodology

Both qualitative and quantitative methods were used to design the research.

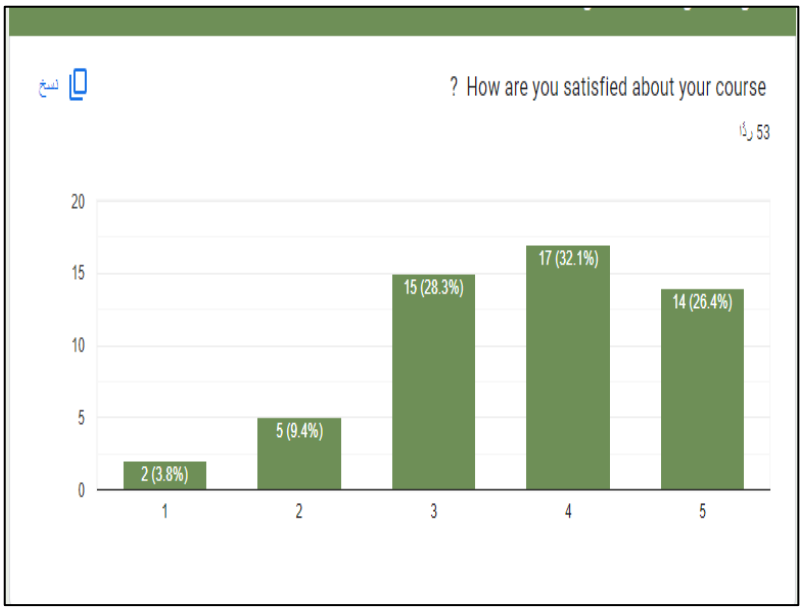
All theoretical information was collected by reading scientific books, previous related research, scientific articles, and the researcher's experience.

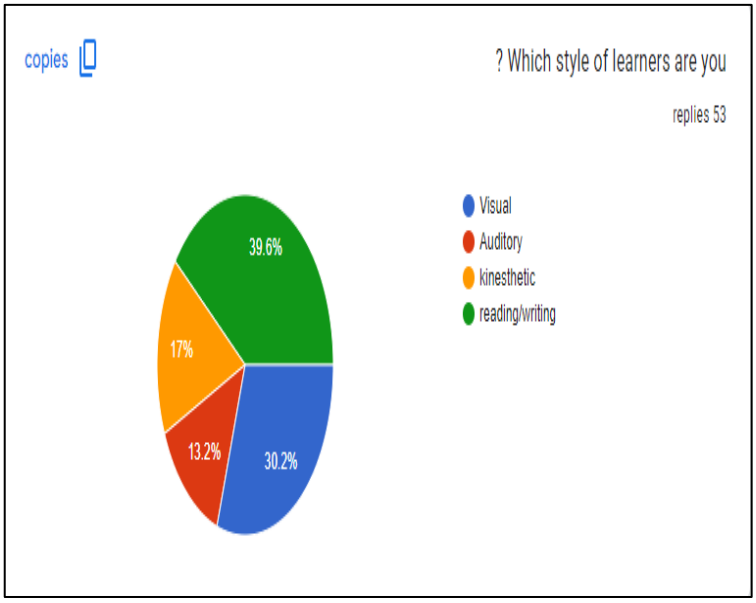
The quantitative chosen method was online surveys for teachers and students to collect data.

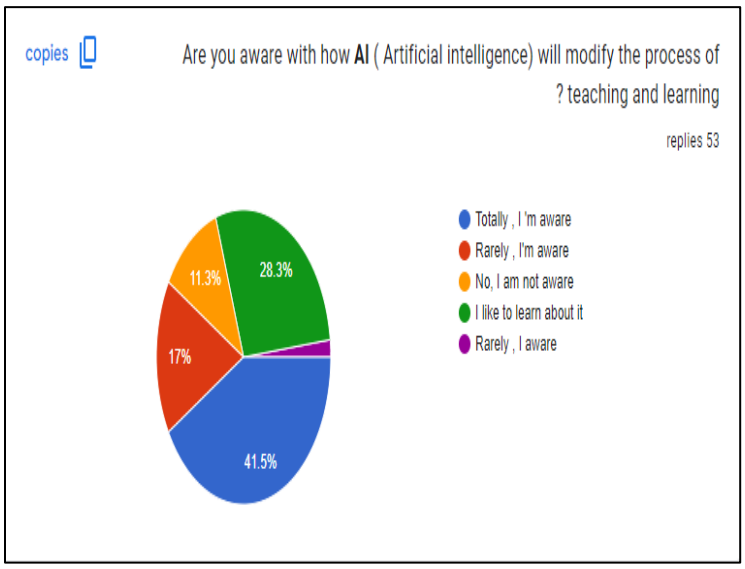
Surveys utilized in the current research were created by the researcher and were based on information about modern teaching and learning strategies, assessment tools, students’ needs, and the usage of modern technology and multiple resources in education from the extant literature and the experience of the researcher. The surveys were generated using Google Forms, the online platform through which they were disseminated. All questions were shaped in a set of online questionnaires to attain the students' and teachers’ perceptions and satisfaction levels. The surveys were sent to the students and teachers via different online portals, including the learning management system Google Forms, social networking apps (WhatsApp), and emails.

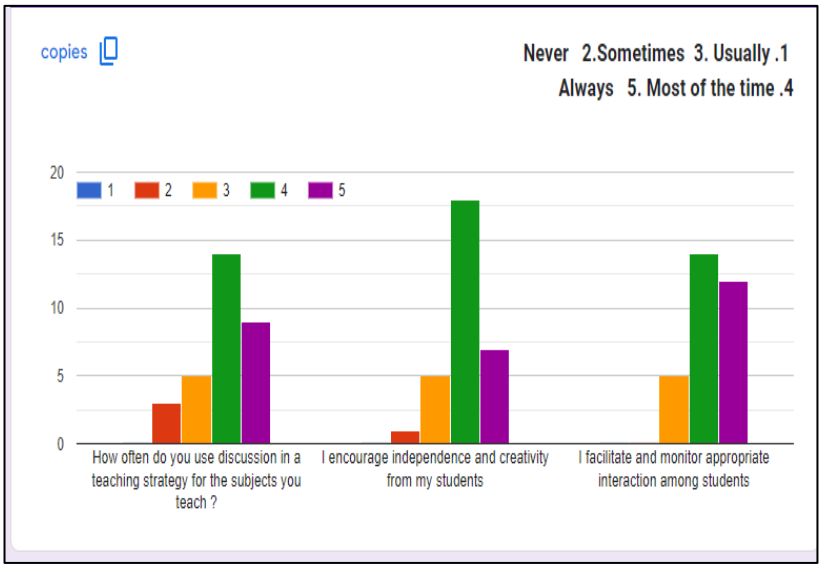
The collected data were analyzed using Google Forms analysis, excel sheet analysis, bar graphs, charts, and tabulation. The results of data analysis were displayed and discussed to guide further studies related to modern teaching and learning strategies.

Data Analysis









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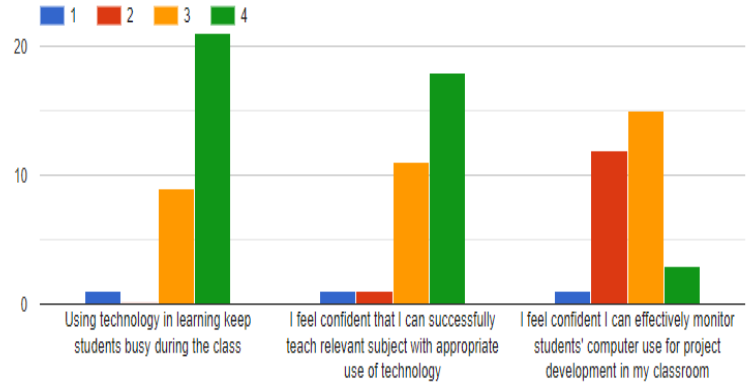

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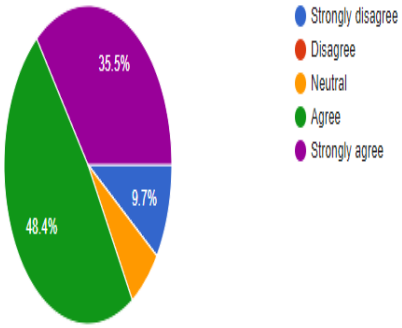
I think using AI (artificial intelligence) in education will prepare the students for the future

replies 31



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Strongly agree 2. Agree 3. Disagree .1
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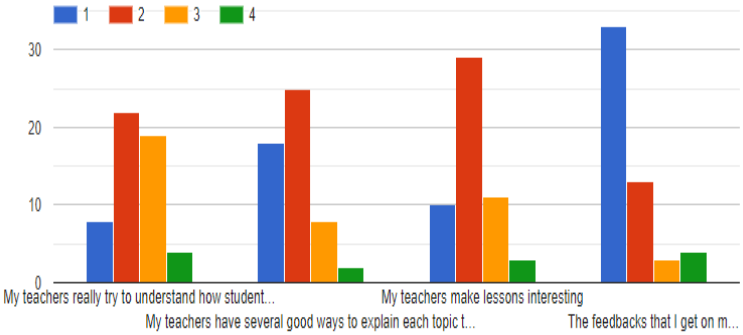

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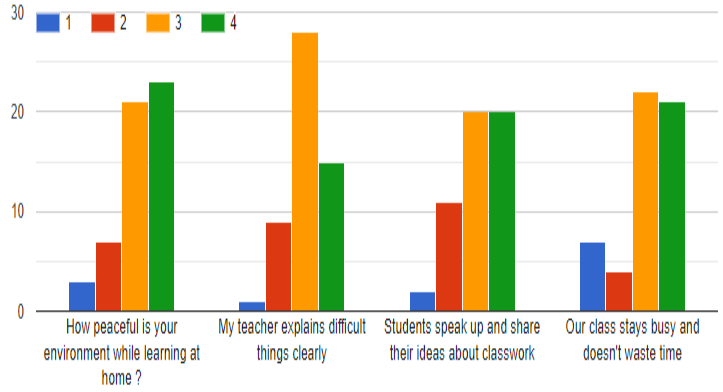
Never 2. Rarely 3. Normally 4. Always .1



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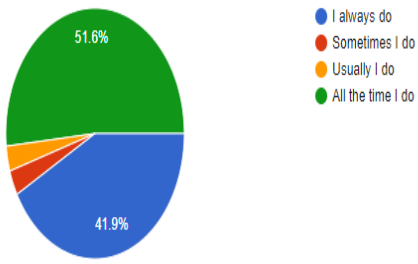
Providing timely , constructive feedback to students about assignments and questions is helping in students progress

replies 31



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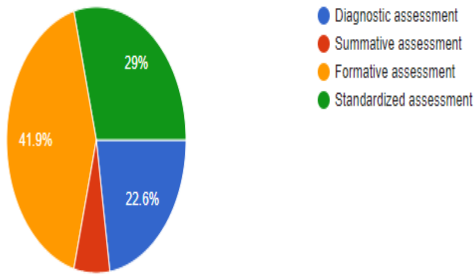
? Which type of assessment do you use mostly with your students

replies 31



Results

The study conducted online surveys for students and teachers concluded that access to a variety of learning resources and the usage of modern techniques in teaching promote the academic performance and outcomes of the students.

Moreover, learners' responses indicated that using technology facilitates the learning process and they feel user-friendly with technology.

The findings of this research demonstrate that the academic achievement of students can be improved by modifying teaching and learning strategies, using multiple resources, and integrating modern technology in the classroom.

Some of the participants are satisfied with online learning, while others aren’t satisfied. These results are based on the students’ learning styles, communication, and facilities of online education.

The results of the research literature are also consistent with the findings of the current survey data analysis examining the effect of adaptive teaching and learning strategies to meet the learners' needs in current education.

Conclusion

The concept of adaptation has been an important issue of research for learning systems in the last few years. The purpose of the current research was to examine the effect of adaptive teaching and learning strategies on academic achievement of students. Research has shown that the application of adaptation in education can provide a better learning environment since learners perceive and process information in very different ways. So, the adaptive educational strategies and systems are an alternative to the traditional teaching. Modern teaching strategies attempt to be more adaptive by building a model of the goals, preferences, and level of knowledge of each student, and using this model throughout the interaction with the student to adapt to his/her needs.

The study by conducting surveys for students and teachers concluded that access to a variety of learning resources and modern techniques promoted the academic performance of the students.

Moreover, learners' responses indicated that using technology facilitates the learning process and they feel user-friendly with technology.

The findings of this research demonstrate that the academic achievement of students can be improved by modifying teaching and learning strategies, using multiple resources, and integrating modern technology in the classroom.

The results of the research literature are also consistent with the findings of the current survey data analysis examining the effect of adaptive teaching and learning strategies to meet the learners' needs in current education.

Recommendations

Based on the findings, the following are recommended:

1. Based on students ‘needs, educators should always be updated on new techniques and educational strategies.
2. Educators should be encouraged to use a variety of learning resources in the teaching process to keep students engaged and to improve their outcomes.
3. Educators should learn skills to provide a suitable environment for students to feel safe and participate in the learning process.
4. Encourage students to define their challenges rather than providing challenges for them.
5. Enhance giftedness and creativity and encourage participation in national and international educational competitions.
6. All educational staff are highly recommended to learn about the deeper value of AI for development and its applicable role in planning for the future.
7. Extra academic surveys of different samples and different levels should be conducted.
8. Apply adaptive teaching strategies with learners in some schools for at least one academic year and compare the results with traditional methods of teaching.

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