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Educational Psychology and Learning Styles: Adapting Teaching Methods for Student Success

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ABSTRACT
Educational psychology can be defined as the study of improvement of education by examining the ability of the students and the appropriateness of the method used to teach them, as well as other important factors affecting the learning process. When it comes to improving the learning process as well as the achievement of the intended learning outcomes, it is crucial to understand how students learn. This study discusses the work of educational psychology together with the analysis of learning styles which is a rather popular but still rather debatable topic as well as the evaluation of such more effective methods as differentiation and activity approach. Despite concepts like visual, audio, and voyager, recent research findings are unsure regarding the effect they have on academic accomplishment. To fill this gap, this study will look at ways that helps instructional practices that focus on cognitive activities, procedures that are flexible, and those that support interaction enhancing students' outcomes. Using the Interactive-Constructive-Active-Passive model, the paper analyzes the connection between the teaching strategies and the students' activity and performance. Research indicates that the method of differentiation and active student participation helped in boosting the performance, interest and course retention. The study calls for a change in the current practices and provides suggestions on how teachers can design classrooms that are more effective in addressing the needs of students.

Key words: *Educational psychology, Interactive-Constructive-Active-Passive model, retention, accomplishment*

1. INTRODUCTION

Conflict management as part of organisational behaviour that is focused on people's interactions in a workplace Is indeed an interesting topic of study that can help people learn how to deal with conflict in an organisation. It is helpful to educators as it offers information about cognitive, emotional, and social aspects that affect learning, so that they can modify their approaches. The issue of learning styles is among the most popular topics throughout the years in educational psychology due to its proposition that students are best tutored using instructional techniques that fit their preferred mode of learning. Although this theory has been embraced in the educational circles, recent research findings question the viability and efficiency of the theory. These studies claim that the division of learning styles into visual, auditory, and kinesthetic is not accurate in terms of how the human brain learns. As a result, the educators are more inclined toward more practical teaching approaches like differentiation, activity-based learning, and cognitive participation that are positively impactful on learning.

The theory of learning styles emerged in the late twentieth century and was popular because of its apparent logic. It implies that if the student is a visual learner, then he or she should be taught using images, charts and videos; if the student is an auditory learner, then he or she should be taught through verbal explanations and discussions; if the student is a kinesthetic learner, then he or she should be taught through activities. However, while the concept of learning styles has been embraced in learning institutions, research has not given strong evidence to support the notion that learning should be done in a style that is preferred by the learner. In their meta-analysis, Pashler, McDaniel, Rohrer, and Bjork failed to identify any studies that supported the matching hypothesis of learning styles (Pashler et al., 2008). They concluded that students may have preferred ways of receiving information but this does not affect their learning in any way.

Subsequent research has gone further in discrediting the learning styles concept. Husmann and O'Loughlin investigated the correlation between the students' learning preferences and their academic achievement in an anatomy class (Husmann & O'Loughlin, 2019). They found out that there is no relationship between the learning styles of the students and their performance; this means that learning is not a function of the learning style but rather of the quality of the instruction and the level of interest. Riener and Willingham (2010) also pointed out that the human brain is plastic and that all students are best served by a variety of instructional approaches rather than a single approach. Thus, these research results suggest that learning styles should not be used but rather aim to develop the approach to teaching that would enhance the learning processes.

One of them is the differentiated instruction which means that the teacher adapts the teaching strategies according to the students' learning readiness, their preferences, and their learning styles. While learning styles suggest that students learn better in a particular mode, differentiated instruction focuses on the variety in the manner in which content, process, and products are delivered. Differentiation is a planned strategy that allows students to access information, develop skills, and show their knowledge in more than one way (Tomlinson, 2014). This method acknowledges the fact that students are different in their learning abilities and experiences and therefore the need to teach them at their level. Through using various teaching methods like scaffolding, giving tier duties and grouping, the teacher can be in a position able to meet the needs of all the students.

Another very effective strategy for instructing is the active learning as it implies that students are not mere receivers of knowledge but rather participate in the understanding process. This publication provides evidence on the fact that students who use active learning strategies within the classroom tend to have an excellent performance and also have a good mastery of lessons than learners who use passive modes of learning. ICAP framework that categorizes the levels of engagement based on the behaviors of the students. In their study, the authors found that students learn more when they progress from receiving information (listening to a lecture) to receiving, constructing, and manipulating information (taking notes, explaining what has been said, and discussing and solving problems, respectively). This framework offers a more complex and elaborated model to the learning styles one and shows the impact of the different levels of thinking on the student achievement.

It is important to note that the learning environment plays a crucial role in the success of the students. To this effect, it is crucial to create motivating conditions for learning that would facilitate compliance with an organizational structure that has positive implications on motivation, learning and academic achievement. Students learning is visible when the teacher creates conditions that allow the students to speak their mind and take risks in their learning (Hattie, 2008). As part of classroom management, it comprises of cultivation of trust, development of high expectations, andconstructive feedback. Another factor that is equally important in learning is classroom arrangement, availability of learning resources and learning activities that promote interaction. These conditions create a positive learning environment where students will be able to engage in deep learning and develop growth mind-set which has been associated with academic success in the long run.

Besides the teaching methods, the use of technology in learning has brought a new face to teaching and learning. These digital tools include; Interactive simulations, Virtual labs and adaptive learning platforms as they allow the learners to learn in an interactive manner. However, the applicability of the educational technology is very much influenced by it's adoption level in the curriculum. Technology integration in learning should be done in a way that is informed by principles of instructional design to avoid a negative impact on learning (Clark & Mayer, 2016). It is therefore very important that technology is integrated into teaching and learning with a view of accomplishing specific teaching and learning goals and objectives and not just for the sake of it. Thus, it becomes crucial for educators to be selective in the use of the tools and to ensure that they are used appropriately.

However, compared to misconceptions of learning styles, there is a large body of research literature and consensus across cognitive sciences supporting or endorsing the identified teaching practices. For instance, the retrieval practice and the spaced repetition are effective in increasing long term storage of information. Students who practice self-testing and retrieval are more effective than students who use passive methods of studying (Roediger & Butler, 2011). In the same regard, literature sources reveal that spreading out more time for learning in unit instead of studying a single unit at a time is in line with higher unit recall and transfer. These cognitive principles are useful in understanding how the instruction can be structured to enhance the learning process of the students.

However, it will also be quite appropriate to discuss the element of metacognition in the learning process. It appeared that a useful set of strategies is metacognitive strategies: students' self-regulated thinking and talking about their learning and learning processes have positive impact on academic performance and problem-solving skills. Students who have metacognitive knowledge are capable of planning, monitoring, and assessing their learning processes, thus enhancing self-regulation and learning self- management (Zimmerman, 2008). Metacognition can be promoted in learners by having them establish learning objectives, monitor their progress, and evaluate their learning processes. This approach enables students to acquire some important skills that they can use in their lifetime learning process that is not restricted to the classroom.

Therefore, although learning styles have been popularized in education, the current research indicates that it is not valid as a teaching approach. Educational professionals should embrace empirical practice as opposed to the learning style hypotheses among them are; differentiated instruction, active and cognitive learning. When teachers adopt the deep learning approaches, create a positive learning environment, and use technology appropriately, they will be in a position to address the needs of the learners. In addition, the use of cognitive science knowledge such as retrieval practice, spaced repetition, and metacognition can improve the learning outcomes of the students. In the future, educational psychology must persist in promoting the use of instructional practices based on research to provide all learners with quality and efficient learning.

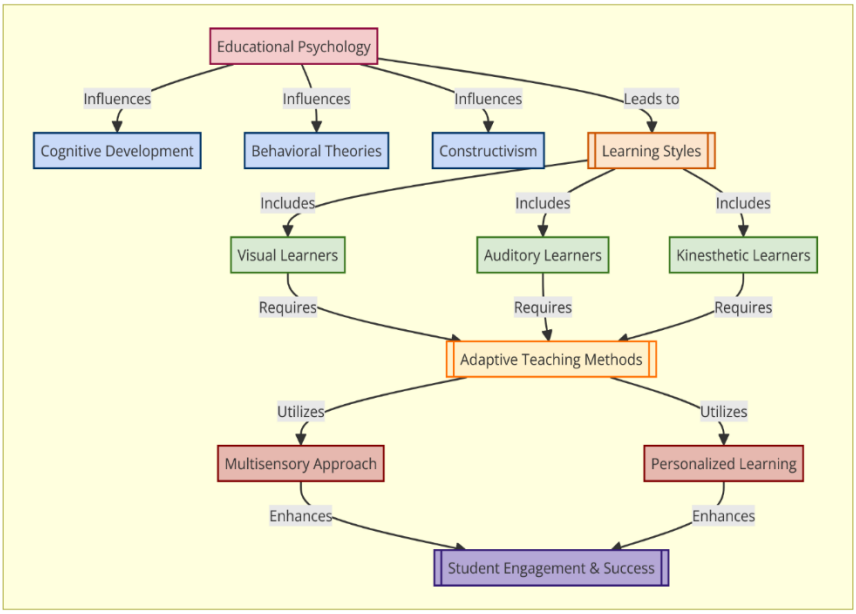

Figure 1: Educational psychology is a very important component in the teaching process since it involves the use of cognitive development, behavioural theories, and constructivism. These factors help in the analysis of learning styles that divides students into visual, auditory, and kinesthetics learners. In this way, the educators can apply the teaching strategies that are more suitable for the students, for example, multisensory and personalized learning. Therefore, accommodating

learning styles has the capability and potential in enhancing students' achievements besides enhancing knowledge acquisition and retention.

2. MATERIALS AND METHODOLOGY

2.1. Study Design

This research work uses quantitative research method to assess the effectiveness of different teaching methods on students' performance and interest. Student learning engagement was measured by the degree of active lecturing methods, the usage of differentiation techniques in classroom and the active learning in accordance with the ICAP model of learning. The study adopted a comparative research design to compare the effectiveness of traditional teaching methods that involve the use of lectures and the modern teaching approaches that involve the students.

2.2. Data Collection

The data for this study was collected from a structured academic environment that involved different subjects such as Mathematics, Science, History, Literature and Economics. Active learning strategies were assessed by comparing the performance of the students under traditional lecture method with that of the students under active learning methods like group discussions, problem solving and other activities. The performance of the students was compared before and after the use of active learning strategies in order to establish the level of improvement. To accommodate the differentiation of instruction, data was gathered from general classroom, group learning, project based learning and individual education plan. The scores before and after differentiation were recorded to determine the impact of instructional adaptations on the students' performance. The study also sought to establish the level of engagement of the students based on the ICAP model of engagement which comprises of passive, active, constructive, and interactive levels of engagement. The students' activity and achievement were measured in various levels of interaction, from the traditional passive receiving of information during lectures to the active discussion in groups. The level of learning engagement of the students was also measured in terms of low, moderate or high learning engagement within each category.

2.3. Experimental Procedure

The study entails comparing learning effectiveness of different instructional methods. About active learning strategies, the students were first exposed to conventional teaching methods before the incorporation of active learning strategies. The pre- and post-intervention scores were compared to determine the changes in the performance of the students in terms of their average scores. In the same way, differentiation was applied to the learning context and the data collection was done at two points: pre- and post-intervention. The degree of effectiveness of these practices was then ascertained through the assessment of performances of students in the different environments. To assess the level of students' engagement, a structured observation approach was used. Teaching and learning strategies that were in line with the ICAP framework were used to teach the students and their engagement was determined by their participation, response to instructions and activities, and interaction during problem solving or during discussions. The percentage of students who were passive, active, constructive, and interactive was also determined for the purpose of comparison.

2.4. Data Analysis

The collected data was analysed using quantitative analytical approach. Mean scores were used to describe the data collected before and after the instructional interventions, and the performance gains were computed in terms of percentage increase. Interdisciplinary comparison was made to identify the efficiency of the methods used in teaching various subjects and in different learning contexts. To evaluating the level of student engagement, the engagement level was divided into low, moderate, and high and the number of students in each level was determined. The level of engagement of the students in passive, active, constructive, and interactive learning activities was also compared to see the level of engagement of the students in different instructional environment. The data was also used to determine the relationship between the teaching techniques used and the performance of the students. Chart and line graphs were incorporated to communicate rates of learning and interaction amongst students regarding certain pedagogical strategies.

3. RESULTS

Table 1: Effect of Active Learning Strategies on Student Performance

The analysis of the results of the study comparing the traditional method of teaching through lectures and the active learning strategies show that the later has a positive impact on the performance of the students in all the subjects. The results showed that students taught under active learning condition performed much better that those who were given traditional lecturing method. Mathematics and Science achieved an enhancement of 14 percent; the percentage increased

from 68 percent to 82 percent and from 71 percent to 85 percent respectively. Likewise, the performance of History and Literature increased by 14 percent while that of Economics increased by 15 percent. These results indicate that strategies like discussions, practical assignments and problem solving enhance the understanding and knowledge retention of the students. The consistency in the increase of scores across the subjects shows that active learning is useful in various fields of study.

Subject	Traditional Lecture Avg. Score (%)	Active Learning Avg. Score (%)	Improvement (%)
Mathematics	68	82	14
Science	71	85	14
History	64	78	14
Literature	66	80	14
Economics	69	84	15

Table 1: Effect of Active Learning Strategies on Student Performance

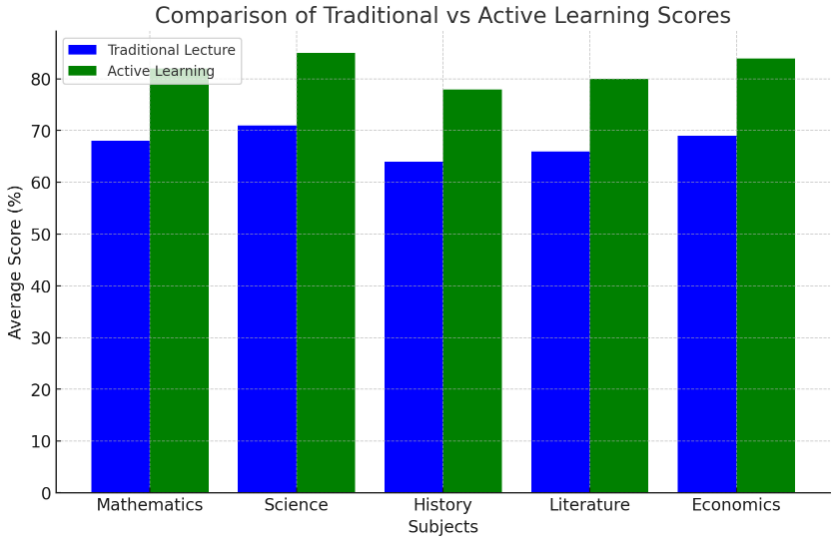

Figure 2: Comparison of Active Learning Strategies on Student Performance

Table 2: Student Engagement Levels Based on the ICAP Framework

ICAP has divided the students' participation into four categories which include the Passive, Active, Constructive, and Interactive. The findings reveal that passive learning which is mostly linked to lecture mode leads to the highest level of low engagement at 72% while active learning methods such as group discussions bring down the percentage of low engagement to 10%. The active notetaking increases the engagement level slightly with 40% of the students in the low engagement level and 35% in the moderate level of engagement. Problem solving as a constructive learning strategy also increases the level of engagement by 45% of the students to moderate level and 35% to high level of engagement. The most important observation is that the use of interactive engagement activities like group discussions leads to the highest percentage of students (60%) falling under the high engagement level. These findings underscore the value of the interactive and problem-solving approaches in enhancing the level of thinking.

Engagement Level	Passive (Lecture-Based) (%)	Active (Notetaking) (%)	Constructive (Problem-Solving) (%)	Interactive (Group Discussions) (%)
Low Engagement	72	40	20	10
Moderate Engagement	18	35	45	30

High Engagement	10	25	35	60

Table 2: Student Engagement Levels Based on the ICAP Framework

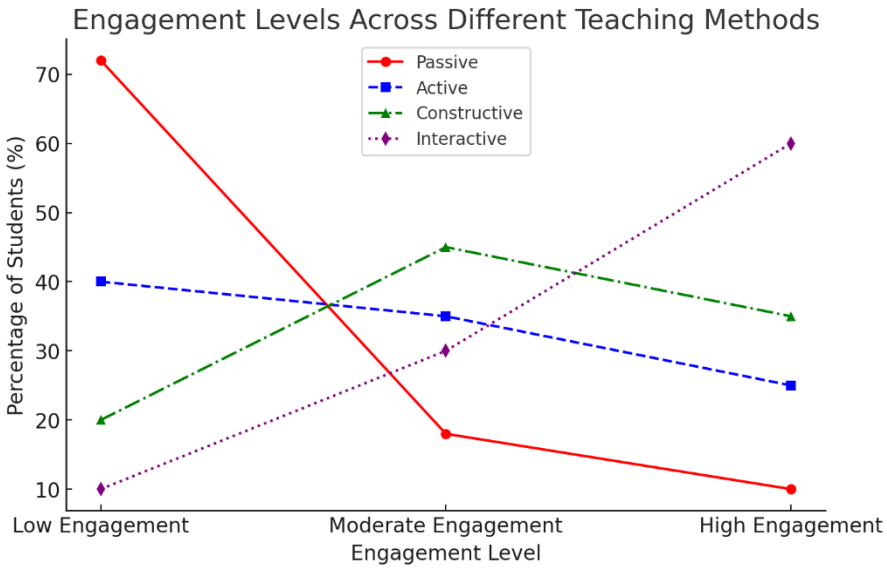

Figure 3: Engagement levels across different teaching methods

Table 3: Impact of Differentiated Instruction on Learning Outcomes

Heterogeneous learning improves the learning achievements of students as it is reflected in the changes in the average scores in different learning environments. The largest improvement is seen in the learning plans for individuals where the students' performance increased from 62% to 83%, which is a 21% increase. ; As for the other two QLEs, ESL and project-based learning as well as the use of mixed-ability group strategies proved to enhance the learners' achievement by 17 percent; it stresses that collaborative and learner involvement approach are effective. Even the general classroom instruction which has recorded the least improvement of 13 percentage point shows that differentiation has a positive effect on the students' performance. Therefore, providing customized instruction to the learners improves the academic achievement of students besides increasing their competence in the course. Therefore, the incorporation of differentiation strategies into the teaching-learning process can be a useful way of catering for the diverse learning needs and enhance the achievement of the intended learning outcomes.

Learning Environment	**Pre-Differentiation Avg. Score (%)**	**Post-Differentiation Avg. Score (%)**	**Performance Improvement (%)**
General Classroom	65	78	13
Mixed-Ability Groups	63	80	17
Project-Based Learning	68	85	17
Individualized Learning Plans	62	83	21

Table 3: Impact of Differentiated Instruction on Learning Outcomes

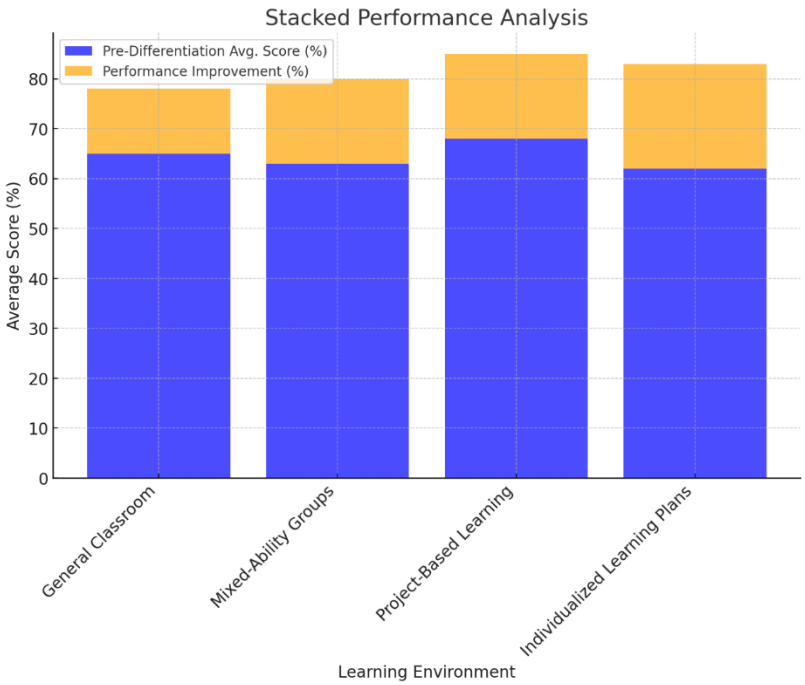

Figure 4: Stacked performance analysis

4. DISCUSSION

Effect of Active Learning Strategies on Student Performance

Many researchers and scholars have come up with different methods of learning, and the active learning techniques have been proved to boost the students' performance in their various classes. From the table below, it is evident that the scores of the students in Mathematics, Science, History, Literature, and Economics were enhanced when active learning techniques were used. The improvement varies from 14 percent in Mathematics and History to 15 percent in Economics. This implies that active learning not only improves the knowledge of the students but also leads to better performance. The conventional method of teaching through lectures seems to have some drawbacks in terms of the level of student participation and therefore the average marks obtained. Active learning strategies like problem solving, group discussions and practical assignments make the students more involved in the learning process and has been found to enhance the learning outcomes (Freeman et al., 2014). These findings are in line with other studies that have established that active learning enhances the development of critical thinking and thus enhances the academic achievement (Prince, 2004).

Student Engagement Levels Based on the ICAP Framework

The engagement of the student is very important, and Table 2 shows the result of the learning activities depending on the level of engagement. The ICAP framework divides the students' engagement into four levels: Passive, Active, Constructive, and Interactive. From the table, passive learning activities such as lectures lead to low participation and low cognitive activity with only 28% of the students being actively engaged. On the other hand, the form of learning that involves the use of group discussions is highly engaging, and 60% of the students are always involved. Engagement in interaction enhances the depth of thinking, which in turn enhances comprehension and recall (Doolittle et al., 2023). The level of engagement has been found to be higher in constructive engagement where students are required to solve problems on their own as compared to passive engagement (35%). These findings are in support with the postulation of Hidi and Anderson who opine that students' motivation and achievement is boosted by constructive and interactive activities (Renninger et al., 2014). Hence, it is possible to state that the application of more interactive and constructive approaches can enhance students' results.

Impact of Differentiated Instruction on Learning Outcomes

The concept of differentiation, which involves the provision of learning activities that are unique to the needs of the students, has a significant effect on the performance of the students. From the data presented in Table 3, it is evident that there is a positive change in the students' performance in different learning environments when differentiated instruction is implemented. The largest gain was recorded in Individualized Learning Plans where the students' performance improved

by 21 percent. This means that, differentiated learning strategies meet the needs of individual learners in a better way than other learning strategies since they address certain learning difficulties. On the other hand, general classrooms have an average increase of 13% which indicates that the one-size-fits-all approach is not as efficient in addressing students' needs. The two approaches of mixed-ability groups and project-based learning also showed an improvement of 17%. These studies indicate that when the teacher organizes students into groups, provides individual assignments or uses projects as a means of teaching, learning achievement and interest is boosted (Smale-Jacobse et al., 2019). Therefore, differentiated instruction is still a significant approach to catering to the diverse learning abilities of students and ensuring that they perform to the best of their abilities.

5. Ethical considerations and limitations

Ethical issues and limitations are some of the issues that should be considered when doing research on educational psychology and learning styles. One of the ethical issues is the protection of students' information especially when evaluating their learning and performance. The students should be given a consent to participate in the study and in case the students are below the age of 18, their parents or guardians should also give their consent and the data collected should be handled with a lot of care (Eikelboom et al., 2012). The third ethical consideration relates to the possibility of bias in the use of the different teaching techniques. Teachers should avoid bias towards any of the learning styles since this will disadvantage some students and reinforce the existing gaps in the class (Mayer & Alexander, 2017). However, there is a limitation in terms of the generalization of the results because learning styles are unique to each person. It is important to note that the findings obtained from one classroom, or a certain educational system may not be generalized because students from different cultural background, different socio-economic status as well as individuals may differ in many ways (Pashler et al., 2008). Additionally, the focus on the learning styles approach may overshadow the other general effective practices that are beneficial for most students (Riener & Willingham, 2010). Therefore, while considering these ethical issues, the researchers and educators have to bear in mind the generalizability of the findings.

6. CONCLUSION

Education psychology aims to help in studying the learning process and acquisition of knowledge among students in various educational milieus. In the process of improving student achievement, it is crucial to consider the best practices in teaching that address the students' cognitive, emotional, and social development. One of the most discussed issues in this area is the learning styles, which presupposes that students have specific preferences in terms of receiving and comprehending the information. However, the validity of this theory has been increasingly under debate in the recent past. In fact, research studies conducted on the use of learning styles in classrooms have not shown that the approach of adapting to the learning styles of students leads to better performance. This research paper looks at the current state of the learning style debate and offers instead of learning style the use of instructional approaches such as differentiated instruction, active learning, and cognitive engagement.

Thus, by paying more attention to the ways that engage students' higher-order thinking skills and offer them various learning experiences, teachers can enhance the learning environment. The purpose of this paper is to bring out the existing studies done on these instructional methods and make a detailed evaluation about their effects on students' performance and participation.

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