Investigation of Evaluation Scheme for Slow and Advanced Learners: A Retrospective Approach

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***Abstract*—In academia, there is no distinct approach to evaluate the students based on their cognitive abilities but the same set of exams decides the performance of all the students. This conventional paradigm may lack considering the basic needs of students, who struggle in understanding compared to their peers, termed as Slow learners. Thus, this study is focused on analyzing the needs and performance of Slow learners in the conventional Engineering education system and discusses the factors that need to be considered for effective evaluation of such students. The survey was conducted with 45 participants, and a thoughtfully designed questionnaire, targeting the distinct learning ability of students and the conventional evaluation process, was answered with invaluable suggestions from a wide range of participants from various backgrounds viz. academicians and students. The participants pointed towards the urgency of such an evaluation reform in Engineering education with a variety of possible strategies to reach this goal. Based on the observations from the answers to the questionnaire, an experimental setup for improving the performance of Slow learners was also framed. The results from this setup show remarkable improvement in the progress of Slow learners with enhancement in metrics like the gain value of 23 and percentage improvement of nearly 218%, which is a success for this study. Although the survey demanded a different evaluation method for Slow learners, it cannot be discarded that with the number of challenges like complex grading systems, potential bias, standardization issues, and institutional policies, it is difficult to implement. Thus, through suggestions from participants and with in-depth analysis, it can be concluded that rather than changing the evaluation scheme it will be feasible to diversify the present evaluation pattern keeping the flexibility and room for improvement of Slow learners. This study will prove as a navigator and a milestone for the challenges faced by many such students in Engineering colleges with evaluation systems that encompass the possible support mechanism.**

***Keywords*—Bloom Taxonomy; Slow learner; Advanced Learner; ICT tools; Engineering Colleges; Microteaching.**

ICTIEE Track: Assessment of Effective Teaching
ICTIEE Sub-Track: Empowering Students through Effective Assessment

I. INTRODUCTION

With the present academic scenario, a philosophy of "One-size-fits-all" is being adopted in evaluating students of different cognitive skill levels. In traditional classrooms, the same set of methodology is followed to test and evaluate all students besides their varying potentials. But in the real sense, all students do not possess the same understanding of a topic using a similar teaching style and so it is sometimes argued that they should not be evaluated based on that understanding. By virtue of understanding a concept, the learners may be categorized as slow and advanced learners. A student is considered a slow or advanced learner by the rate at which he learns (Joseph, 2023). An advanced learner is one who possesses a higher degree of understanding than the norms and is thus referred to as "gifted" (Renzulli, 2012). These scholars show advanced abilities in numerous domains, including intellectual pursuits, creative gestures, artistic approaches, and specific academic fields such as arts, mathematics, or science (Campbell, 2018) (Tomlinson, 1995). It is advocated that institutes should run special programs that accelerate their performance and offer them opportunities to better understand the subject which cannot be possible in regular classrooms (Subotnik, 2011). jOn the other hand, a slow learner takes longer than average to grasp and process new information due to specific challenges like the pace of learning, retention and recall, emotional and motivation barriers, self-confidence, attention span, diverse cultural backgrounds, or any social problem (Mohammad, 2014). So, he may require more time, repetition, and resources to grasp and retain new information. Nowhere it can't be misunderstood that a slow learner has some mental disability rather than a student who learns at a bit slower pace than his peers. It has been proclaimed many times that the way the conventional academic system was working seems insufficient to cope with this issue. Various research shows that these slow learners struggle with conventional teaching methods that do not cater to their special learning needs. Since the number of students these days facing such issues is quite countable, it is a matter of concern for the educational system to diagnose such learners and help them in all possible ways. It is analyzed that each learner inherits a special approach to learning which is affected by one's needs, choices, and learning style (Kolb, 2015). Many such approaches have been discussed in past studies with their related outcome (Nithya, 2024). However, there are various studies focused on analyzing the need for such an approach and the remedial methods in the latter stages of primary and middle schools (Mohammad, 2014) (Mohmoud, 2014) (Imran, 2023). Even studies focusing on various learning capabilities of digital platforms are also done (Tayade, 2018) (Joseph, 2022) (Geetha,2021). M. Imran et. al. stated that helping a student who is a slow learner has a great impact on the society we live in. This approach

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makes society much fairer and more transparent to everyone (Imran, 2023). Many researchers advocate a diverse way of understanding students with varying understanding potential (Chauhan, 2011)(Kashyap, 2019). Even several argue that in human evolution every human is a unique individual, who can grab the context to his deepmemories making them more meaningful (Ahmed, 2013). Owingto previous studies, very little research has been carried out to inspect the need for different approaches at College levels especially in Engineering colleges. So, it is a matter of in-depth investigation to analyze the need for a distinguished evaluation process for two different groups of learners in higher education. In a quest to find the meaning of the relevance of different evaluation approaches for slow learners and encapsulate the remedies to the issues, a vast surveyis carried out in this manuscript. Not only the professional education perspective, but the study is also relevant to advocating the social implications of education. The ultimate aim of the engineering education system is to prepare an individual with a meaningful skill set. However, this cannot be possible without a precise evaluation of the understanding levels on which this study is focused.

II. Research Methodology

Bloom's Taxonomy is a framework designed to categorize educational goals and related outcomes. It was introduced in 1956 by Benjamin Bloom and is a widely used method for improving the education system (Bloom, 1956). The taxonomy is structured into three domains: Cognitive, Affective, and Psychomotor. However, our study is targeted at the Cognitive domain so the focus is on exploring this domain in depth. The cognitive domain is further divided into six levels of hierarchy ranging from simplest i.e. remembering, understanding, applying, analyzing, evaluating, and creating as shown in Fig. 1. These levels enable the teacher to design curriculum and assess with deeper understanding and critical thinking. This domain is designed to develop the cognitive skill set of students ranging from the basic understanding to the higher-order intellectual capabilities for solving any problem.

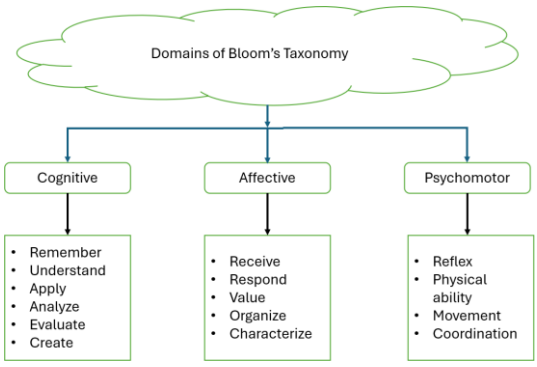

Fig. 1. Domains of Bloom's Taxonomy (Bloom, 1964)

The cognitive domain is the one where students understand the concept and showcase it by remembering, applying, and creating which is analyzed at every step of the student's development to evaluate the progress of his intellect. Thus, in this study, the elements of this domain are very significant to discuss and understand. While we talk of the evaluation of various students, it is noticed from our personal experience of 5 sections from the same semester that the level of understanding of the same subject or topic for different students is different. So, we cannot put the intellect level of all the students at one constant level; rather we can rate them upon their understanding as slow learners, and advanced learners. The results from 5 different classes of the same semester with varying understanding levels of students are shown in Fig. 2. To start with the flow of this work, a sample of people is taken to whom a set of questions are asked and results are estimated based on the responses. This is explained in detail in the sections listed below:

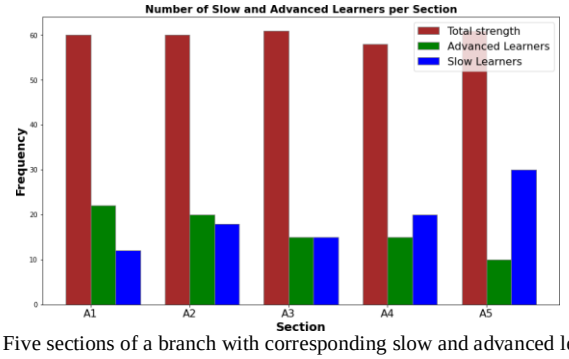

Fig. 2. Five sections of a branch with corresponding slow and advanced learners.

A. Sample

A comprehensive survey was conducted in which 45 participants contributed to thinking through the need for a distinct evaluation process for different groups of learners. The survey coverage should be from all the traits of stakeholders of the education system, so without leaving any such section of the system the candidates were selected.

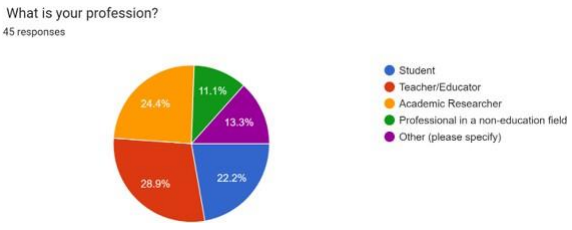

Fig. 3. Variant professionals as participants

These participants were from varying backgrounds including academic researchers, teachers/ educators, students, and

other professionals from the non-educational field. These participants' highest levels of qualification ranged from bachelor's degree to doctorate level as depicted in Fig. 3. Since this study is not limited to the learner but also the role of educator is very much desired in discussing the basic approach and need of such an analysis of the system. Thus, the participants from all the age groups and related professions were invited to contribute to the research. This approach will try to grab the vivid thoughts and ideas to a single platform to give an effective solution.

This study aims to reconnoiter the opinion of different participants on whether the framework to evaluate advanced learners and slow learners should differ or not. To accomplish this, a survey form was shared with the participants consisting of ten multiple-based and two-paragraph-based questions. These questions were very helpful in understanding the opinion of the participants regarding the need for a distinguished evaluation process for two different groups of learners. The main motive of the research is to understand the key concept points which include:

- Different evaluation parameters for slow learners when compared to advanced learners.
- Pros and cons of having different parameters.
- Effect on the academic growth of the learners.
- Potential challenges in implementing the different parameters.
- Strategies for separate evaluation methods.

The variety of valuable suggestions the participants provided helped evaluate and strategically customize the parameters for slow and advanced learners. This feedback is explored to acquire insight into potential recommendations for the necessity of distinct evaluation methods for slow learners in educational settings. The process for the data collection was completely anonymous and designed to encourage honest responses and in turn, enrich the quality of the information received. Carrying a survey without influencing any participant is the backbone of this study which will be used as a milestone in the design of a new approach for the evaluation and betterment of the system.

Statistical analysis was performed on the data collected to identify significant trends in the opinions of various groups of participants. Additionally, this sort of qualitative analysis of open-ended responses not only provides an understanding- ing of the opinions of others but also helps gather deep insight into the logic behind the discrete viewpoints. The amalgam of quantitative and qualitative data resulted in a comprehensive interpretation of distinct perspectives on evaluation approaches. This led to the evolution of effective and inclusive practices for educational assessment.

B. Research question framework

The study is carried out by designing questions that will cover the basic idea of this research. It starts from knowing the primary details like age and qualification, to the higher degree of questions where participants brainstorm their discretion towards the opinion they have for the strategies for slow and advanced learners. The survey is so designed that the respondent should get familiar with each coming question and as he reaches the end, he will be able to answer the typical questions and portray the suggestion with all his understanding from the previous questions. Thus, the questionnaire design itself is self-accelerating and simple to involve a reader to understand the concept and help in visualizing the possible ideas they hope a perfect system should work. Questions that highlight the theme of the study are listed in Table 1.

C. Improvement strategy for slow learners

After gathering valuable insights from the questions asked above, we plan to apply a resultant improvement strategy to various participants, depending upon the level of their corresponding intellect. Owing to this, correlation research was conducted for 10 slow learners from all the sections. These students were groomed on various parameters like mentoring sessions, remedial sessions, practice assignment activities, and peer support/group activities, to increase their academic performance. A pre-test and a post-test were conducted to evaluate the performance of the students after applying various suggestions from the participants. This approach will give a crisp clarity of the improvement in an individual. In the next section, the results obtained from this strategy are framed well and discussed in detail to uncover the usefulness of such a study.

III. Results and Analysis

The survey highlighted trends and notable differences in the opinions of the different groups of participants. Based on the concepts of slow and advanced learners, participants are asked a variety of questions to know their opinions and perspectives towards dealing with both groups of students for effective learning. The results obtained are unique and informative in analyzing the thinking process of a vivid variety of participants. The questioners of Table. 1 are framed in a way to hit the basic theme of this research and the respective results obtained are discussed in this section in detail. We are dividing this section into two parts as given below:

A. Postulates from Survey

The survey for different evaluation parameters for slow and advanced learners explores that 96% of the participants agree to tailor the evaluation parameters at the rate of learning speeds with 89% of participants of the opinion that slow learners should be evaluated on the basis of their efforts and progress over time rather than just based on their final results. They think that the primary purpose of evaluation is to alleviate learning rather than judge students. Keeping the same metrics for both learners does not seem to be a justified strategy for slow learners. Rather, the majority of participants see this approach as the only game-changing solution for the effective delivery of knowledge to weaker

TABLE I
SURVEY QUESTIONNAIRE

Questions	Target Area
How would you rate the importance of tailoring educational evaluation parameters to different learning speeds?	Student Learning Needs
Please suggest why you think the evaluation parameters should or should not be the same for slow learners and advanced learners.	Student Learning Needs
Do you think that slow learners benefit from having different evaluation parameters compared to advanced learners?	Educational Equality
Do you believe that advanced learners should be evaluated with more challenging criteria to keep them engaged and motivated?	Educational Equality
What potential challenges do you foresee in implementing different evaluation parameters for slow learners and advanced learners?	Educational Equality
Do you think we should evaluate slow learners based more on their effort and progress over time instead of just their final results?	Educational Strategies
Should educational institutions implement different evaluation strategies based on students' learning capabilities?	Educational Strategies
Please suggest two strategies for evaluating students with different learning capabilities effectively.	Educational Strategies

sections of students. Arguing so, this analysis directs the use of in-class activities like problem-based and project-based learning in class but with different rubrics for diverse groups of students. This includes the cooperative and empathic approach from peers by assisting them throughout the course of time rather than considering the slow learners as the back-bencher category, as conventionally happens. The ICT tool usage can also be of great help to mitigate the learning gap by designing sessions with detailed and simple techniques of presenting the concepts among such students. These sorts of methods would not only help improve the slow learners' concepts but rather create a feeling of equality and teamwork among all the pupils, creating a much healthier relationship among the learners. Fig. 4, shows the results of the study from the viewpoint of differentiating the evaluation parameter for advanced and slow learners. It can be seen from the chart that the majority of the people opted in favor of this scenario while a few showed opposition to this approach. In Fig. 5, again the importance of this sort of bifurcation is discussed and it can be seen from the figure that many believe in the urgency of this system at alarming rates. So, at the start of the survey, very strong opinions are proposed by the participants. Thus, this study seems to be of interest to them and could generate some meaningful conclusions at the end of the survey.

Participants who are in favor of a distinct evaluation method feel that every student has a different retention period, understanding capacity, learning pace, motivation levels, learning needs, engagement levels, and even different skill sets. Tailoring evaluation parameters to the specific abilities and learning styles of each group ensures fair and accurate assessments and boosts their confidence. Participants perceive that slow learners need more time, additional support, and an alternate approach to evaluation to demonstrate their progress accurately. They think that the students should be evaluated based on the efforts they are making to learn and improve. Participants are convinced by the idea that the evaluation parameters for advanced and slow learners must be meticulously analyzed considering the fairness, educational goals, and specific requirements for each group. However, another group of participants with viewpoints against such evaluationargue that the participants feel that the evaluation parameters should be the same for slow and advanced learners but the parameters for motivation and stimulation of slow learners should be different. They feel that to remain unbiased, tutors can offer customized assessments according to the needs of specific students, fostering a more supportive and comprehensive learning environment. Participants are also convincedby the fact that modifying the teaching pedagogies as per the learning environment and needs of the students can make a big change in reducing the gap between the slow learners and the advanced learners. Many educators who contributed to the survey are convinced by the fact that besides having separate evaluation parameters, the delivery methods should be enhanced so that all learners benefit and understand the concepts. Many regard it as the right approach to forminga question paper that caters to all types of learners without distinguishing them and creating a sense of equality. They also think that tailoring assessments can help in highlighting strengths and areas for the improvement of all learners.

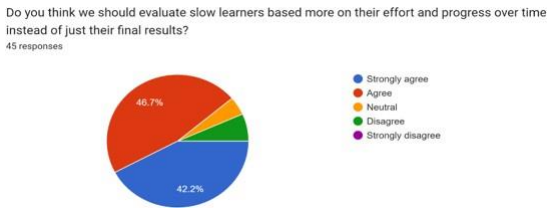

Fig. 4. Results for differentiating the evaluation of slow and advanced learners

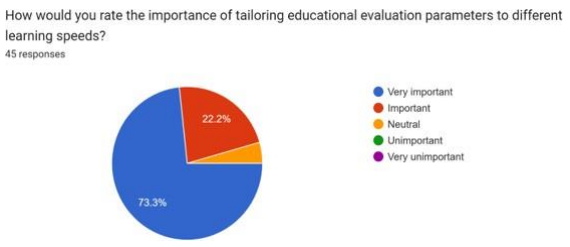

Fig. 5. Results for the gathering importance of the evaluation.

Moreover, these assessments should be challenging yet encouraging for excellence at the same time. Participants argued that applying varying standards considering their learning speed could create a division in the classroom. Slow learners might get stigmatized which affects their self-esteem and thus progress is hindered. One of the participants suggested that apart from student segregation, a much more effective method would be diversifying evaluation methods. By employing a broader range of assessment tools like presentations, projects, teamwork, etc., teachers can gain more precise information about students' potential. Not only unique learning styles but also critical thinking and problem-solving skills are encouraged by this approach in all the students.

This set of questions deals with the benefits and losses of this separated evaluation regime for slow and advanced learners. The charts of Fig. 6 show that 56% believed that slow learners will benefit from having different parameters compared to advanced learners. From Fig. 7, it can be commented that 75% of the participants agreed that the advanced learners should be evaluated with more challenging criteria to keep them engaged and motivated. Participants also foresee the potential challenges faced by institutions and learners in implementing these strategies. Considering these results, it can be observed from these charts that 32% of the participants felt that having separate parameters would increase the complexities in the grading system. Also, 23% suspect that there will be a potential bias or unfair treatment. Around 38% believe that there can be difficulty in standardizing the assessment for different sets of learners.

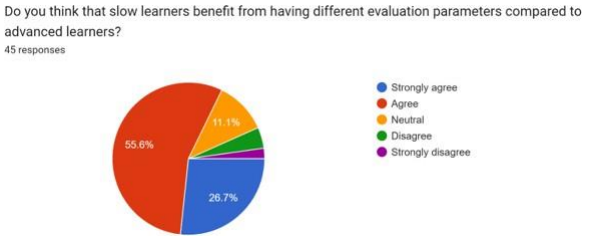

Fig. 6. Results for slow learners benefits with distinct evaluation method.

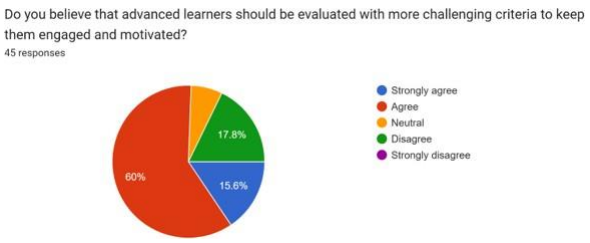

Fig. 7. Results for higher level evaluation demand for advanced learners.

Many factors decide the employability of such evaluation parameters for slow and advanced learners. These factors include specific learning goals, resources available, and the educational policy of a particular institution. So, an approach that maintains a balance between the application of this sort of evaluation method with the after-effects that occur, is more important to focus on for the higher effectiveness. In contrast, to slow learners, advanced learners could benefit from more challenging and higher evaluation metrics that precisely reflect the upper-level comprehension and intellectual cognitive skills. The decision to adopt the same or distinct evaluation parameters must be based on educational goals and context. In societies where equality and standardization are of zenith importance, opting for the same evaluation parameter seems to be of great importance. However, in improving individual learning and personal growth, the diversification of these parameters seems to be a balanced approach that can cater to each student's unique learning journey while creating a feeling of empathy and support in an educational system.

The plot of Fig. 8. shows the potential challenges in implementing the different evaluation parameters. According to the viewpoint of candidates under the survey, the major point of contention for employing such an approach will be the problem of standardizing the assessment. Since this set of evaluations does not already pertain to the ongoing college policy, making one standard system of such evaluation and getting it approved from each section of the organization would surely be a cumbersome and tedious task. Another major concern for hindrance to the approval of such an approach is the complexity of grading various students. This would not be an easy task for evaluating the whole class on two distinct evaluation criteria. One typical set of participants also points to a crucial challenge i.e. possibility of exploitation of this approach to make the system biased or lead to unfair treatment of some section of the class. This could be a valid concern as it is known that systems though designed to help destitute sometimes can be manipulated to help those who are its least beneficiary. In this case, the bias may lead to evaluating those sets of students who usually fall under the advanced learner set with a higher degree of evaluation rubrics but are being evaluated under the category of weak learners. This surely results in unfair treatment that destroys the motive for which this study was aimed.

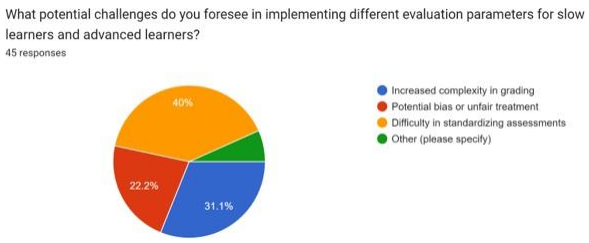

Fig. 8. Results for higher level evaluation demand for advanced learners.

Participants also suggested various methods of diversifying evaluation parameters for slow and advanced learners. Participants advocated the implementation of differentiated assessments allowing educators to evaluate students with dissimilar learning capabilities. They believe that by designing a variety of assessment methods, tutors can introduce diverse learning requirements within the same class. As an example, employing project-based assessments, written assignments, oral presentations, and practical demonstrations does offer students with wider learning prospects and chances to display their understanding with means that are in the range of their great strengths. They also feel that along with customizing the criteria, students with varying capabilities should be given appropriate support which ensures effective and fair evaluation. They also put forward to develop an individual learning plan as an effective strategy for students having different learning capabilities. They suggested tailoring evaluation parameters based on the student's unique abilities and needs. They believe that teaching the concept with real-world applications helps Genzs to show interestin the learning process. Most of the participants stressed the importance of timely counseling of the students and monitoring their progress for individual learning goals throughout the semester. Participants recommended that

- Focus on Differentiated and formative assessments which will establish an inclusive classroom environment where each student regardless of their learning style and pace can exhibit their knowledge.
- Implement regular, low-stakes assessments to monitor progress and provide regular feedback.
- Adjust the complexity and depth of tasks according to students' learning levels.
- Use quizzes, reflections, and peer reviews to gauge understanding and guide future instruction.
- Performance shown in Co circular activities should also be considered during the evaluation.
- Instead of giving marks, there should be a grade bracket based on the input of efforts and output of results.
- The frequency of activity for the slow learners needs to be increased without disturbing their academic tasks.
- Implement adaptive testing methods that adjust the difficulty of questions based on the student's responses, providing a personalized assessment experience for both slow and advanced learners.
- Both practical and theoretical evaluations should be given equal weightage to balance out the supremacy of one over another in the case of slow learners.
- Use portfolio assessments where students compile their work overtime, allowing for a comprehensive evaluation of their progress and capabilities, regardless of their learning pace.
- The slow learner should be given the choice to opt for his/her choice of evolution. (Eg. some can be comfortable orally and others in written)
- Focus on project-based learning and evaluation rather than test-based evaluation
- More Time can be provided to the slow learners.
- Test them only for the learnings they have learned till date.
- Defining evaluation parameters more broadly, to not only focus on academic learning but also the overall well-being of students. This will help in understanding their strengths and weaknesses and a targeted approach to address them can be undertaken.
- Greater emphasis on practical work and assessments over plain theory and exams, allowing for a greater level of visualization and real-world applications.
- Weekly 1-1 meetings for academics and Monthly 1-1 meetings to understand their well-being.

Effective evaluation of learners with diverse capabilities incorporates clubbing differentiated assessment and formative assessment strategies. Differentiated assessment permits students to display their understanding in a variety of ways that suit their capabilities. However, formative assessment with continuous follow-up reinforces gradual improvement and personalized learning paths. The amalgam of these strategies shapes a supportive and inclusive evaluation paradigm that entertains and cultivates the vivid needs of all learners.

B. Experimental setup for Slow learners' improvement:

To enhance the academic performance of slow learners, an experiment was thoroughly designed and conducted to estimate the impact of the suggestions stated in the above part of this section by the participants. For the experiment, 10 students with low academic performance were identified. This

TABLE II
IMPROVEMENT METRICS

Parameter	Mean Value
Gain Score	23
Percentage Improvement	218.83%

Identification was based on the class response, attendance, and performance in the class tests. After identifying the students, a series of interventions were applied which included mentoring sessions, remedial sessions, revision/practice assignments, and peer support activities. Learners were provided with mentoring sessions to offer personalized guidance and support. Remedial lectures were conducted to strengthen the basic concepts of the students. Regular practice exercises were administered to keep track of the improvement and to boost their confidence. Additionally, peer support activities were encouraged to foster a collaborative learning environment.

Over a time of 2 weeks of these interventions, students showed a noticeable improvement in their academics. A post-test showed a significant rise in their score and overall understanding of the subject. The metrics that are estimated for the estimation of performance improvement are the Mean gain score and Mean percentage score. The gain score is a measure used to evaluate the improvement or change in

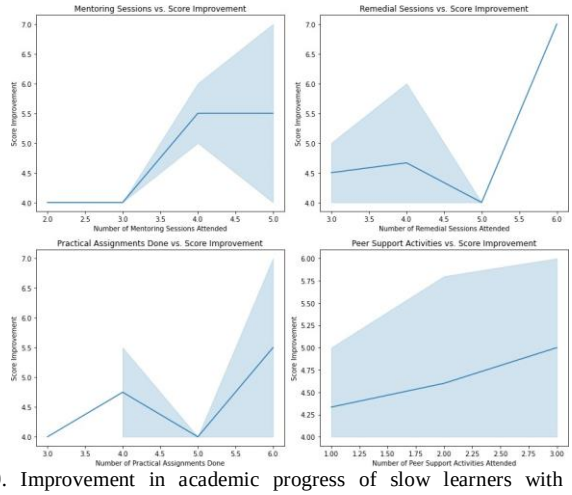

Fig. 9. Improvement in academic progress of slow learners with various approaches.

the student's performance from the pre-test and post-test conducted, whereas percentage improvement expresses the gain or improvement in the percentage of the original (pre-test) score. It is conducted, whereas percentage improvement expresses the gain or improvement in the percentage of the original (pre-test) score (Wang, 2004). It is typically calculated using the formula calculated as

$$Mean\ Gain\ Score = \frac{1}{n}\sum_{i=1}^{n}(Post\ test\ score\ -\ Pre\ test\ score)_i$$

$$Mean\ Percentage\ Score = \frac{\frac{1}{n}\sum_{i=1}^{n}(Gain\ Score)_i}{\frac{1}{n}\sum_{i=1}^{n}(Pre\ test\ score)_i} * 100$$

where

$$-\infty < \text{Mean Gain Score} < +\infty$$

and

$$-100\% < \text{Mean Percentage Improvement} < +\infty$$

As mentioned in Table II, a mean gain score of 23 and a mean percentage improvement of 218.83% are achieved in the experiment performed above which proves the basic idea of this study of modifying evaluation methods for improving the performance of slow learners. The strength and direction of the linear relationship between the variables are also represented in Fig 9. It can be seen from the experiment that by employing the appropriate support and required interventions, the slow learners could attain remarkable academic progress, pointing to the need for a holistic approach to academicsthat takes care of the diverse needs of all learners. Thus, these corrective methods could be used with large groups of students to attain a remarkable improvement to uplift the performance of slow learners.

CONCLUSION

This study aims to analyze the need for a unique evaluation scheme for Slow learners in Engineering colleges. A questionnaire is designed and circulated among various participants to explore the efficacy of present evaluation methods to help learners with a slow learning pace. Survey results point towards a dire need for rectification in the present evaluation approach which could be achieved by diversifying the current evaluation system by employing differentiated assessments, customized evaluation criteria, etc. However, challenges like standardizing the assessment, grading complexity, and chances for possible biasing are a few of the concerns that hinder the advent of such a different evaluation design. Thus, it is analyzed that rather than proposing new evaluation methods, it will be much more reasonable to opt for making room in conventional evaluation schemes with strategies like mentoring & remedial sessions, revision/practice assignments, and peer support activities for slow learners. Such improvement strategies for Slow learners were experimented with 10 students and the results were astonishing with enhanced performance. This study shows that understanding the students and a possible support mechanism in the traditional evaluation approach would result in theupliftment of Slow learners and provide a much more stable educational system where everyone gets an equal opportunityto learn and exhibit knowledge.

REFERENCES

Ahmed, J., Shah, K., & Shenoy, N. (2013). How different are students and their learning styles. *International Journalof Research in Medical Sciences*, 1(3), 212-215.

Bloom, B. S. (Ed.), Engelhart, M. D., Furst, E. J., Hill, W. H., & Krathwohl, D. R. (1956). Taxonomy of educational objectives: The classification of educational goals. *Handbook 1: Cognitive domain.* David McKay.

Campbell, J. (2018). Differentiated instruction and the advanced learner in select middle schools: *A qualitative case study (Doctoral dissertation, Northcentral University).*

Chauhan, S. (2011). Slow learners: Their psychology and educational programmes. *International Journal of Multidisciplinary Research*, 1(8), 279-289.

Geetha, R., Padmavathy, T., & Anitha, R. (2021). Prediction of the academic performance of slow learners using an efficient machine learning algorithm. *Advances in Computational Intelligence*, 1(4), 5.

Imran, M., Ahmad, N., Al-Harthy, A. A. Q., & Jat, Z. G. (2023). Early identification and intervention: Amplifying the voice of slow learners. *AITU Scientific Research Journa*l 1(4), 17-25.

Joseph, B., & Abraham, S. (2022, February). Analyzing the cognitive process dimension and rate of learning to identify the slow learners in e-learning. I*n 2022 International Conference on Innovative Trends in Information Technology(ICITIIT)* (pp. 1-6). IEEE.

Joseph, B., & Abraham, S. (2023). Identifying slow learners in an e-learning environment using K-means

clustering approach. *Knowledge Management & E-Learning*, 15(4), 539-553.

Kashyap, D. (2019). Slow learners: Identification and solution. *Journal of Emerging Technologies and Innovative Research*, 6(6), 718-720.

Kolb, D. A. (2015). Experiential learning: Experience as the source of learning and development. *Pearson Education, Inc.*

Mohammad, T. Z., Mahmoud, A. M., El- Horbart, E. S.M., Roushdy, M. I., & Salem, A. B. M. (2014). Classification model of English course e-learning system for slow learners. Benefits, 3(7), 10.

Mohammad, T. Z., & Mahmoud, A. M. (2014). Clustering of slow learners' behavior for discovery of optimal patterns of learning. I*nternational Journal of Advanced Computer Science and Applications*, 5(11).

Nithya, R., Sathasivam, K., & Ramanathan, M. (2024). Uncovering the relationship between learning trends and graduation outcomes: A retrospective approach. *Journal of Engineering Education Transformations*, 37 (Special Issue 2).

Renzulli, J. S. (2012). Reexamining the role of gifted education and talent development for the 21st century: A four-part theoretical approach. *Gifted Child Quarterly*, 56(3), 150-159.

Subotnik, R. F., Olszewski-Kubilius, P., & Worrell, F.C. (2011). Rethinking giftedness and gifted education: A proposed direction forward based on psychological science. *Psychological Science in Public Interest*, 12(1), 3-54.

Tayade, A., Tayade, S., Chalak, A., & Srivastava, T. (2018). The impact of video-assisted learning (VAL) on slow learners. *International Journal of Biomedical and Advance Research*, 9(1), 13-18.

Tomlinson, C. A. (1995). Differentiating instruction for advanced learners in the mixed-ability middle school classroom. *ERIC Digest* E536.

Wang, W. C., & Chyi-In, W. (2004). Gain Score in Item Response Theory as an Effect Size Measure. *Educational and Psychological Measurement*, 64(5), 758-780.