International Journal of Learning and Teaching

Volume 09, Issue 4, (2015) 431-438

www.ij-lt.eu

Teaching and learning methodologies for improving students' performance in academics

Vinothkanna Rajendran *, Guru Nanak Institute of Technology, Ibrahimpatnam-501 506, India.
Swetha Reddy, Guru Nanak Institute of Technology, Ibrahimpatnam-501 506, India.
Saritha Reddy, Guru Nanak Institute of Technology, Ibrahimpatnam-501 506, India.

Suggested Citation:
Rajendran, V., Reddy, S. & Reddy, S. (2017). Teaching and learning methodologies for improving students' performance in academics. *International Journal of Learning and Teaching*. *9*(4), 431-438.

Received May 25, 2017; revised August 5, 2017; accepted October 10, 2017.
Selection and peer review under responsibility of Prof. Dr. Hafize Keser, Ankara University, Ankara, Turkey.

Abstract

To intellectualize undergraduate education as a process of improving students along the path from novice towards proficient understanding within a given discipline, a study has been done by the authors. To achieve this target, it is important to initiate by identifying what students know, how their ideas align with standard engineering expectations and practices. With these factors in observance, the further step for an educator is to search for instructions and other resources that make it easier to distinguish the curriculum so that it makes learning more vital and relevant. By considering this concept authors have designed a pattern and followed the same, thereby they achieve the improvement in the performance and result of students.

Keywords: Slow learners, tests, remedial classes, performance improvement.

* ADDRESS FOR CORRESPONDENCE: **Vinothkanna Rajendran,** Guru Nanak Institute of Technology, Ibrahimpatnam-501 506, India.
E-mail address: rvinothkanna@gmail.com / Tel.: +91-999-422-9796

1. Introduction

Students come to recognize learning with a sort of prior knowledge, skills, views, and concepts that majorly have an impact on what they notice about the environment and how they understand and establish it. This sequentially affects their capabilities to remember, solve problems and gain new knowledge (Borah, 2013). They are anticipated to improve by following the path of increasing expertise. Thus, our structure of reference for this discussion is focused on helping slow learners move towards the more expert end of the gamut.

For an overall development of an individual, he/she need to possess a thorough knowledge of the basics of any subject related and their applications for current day requirements with updates if any in between. For meeting this gap, the department is concentrating on extra events to be conducted along with the existing curriculum, which is very well planned in advance to the instigation of the semester. They include expert lectures on the subjects as per syllabus, workshops beyond syllabus as per the needs of emerging trends and arranging industrials visits which will make them to learn about theoretical belongings and their working which can be mounted practically (Bednall & Kehoe, 2011).

Career guidance programs based on industry needs are arranged for them in both methodological and non-technical areas so that they will be getting an idea of how to countenance the world after their graduation in respective areas out of their interest. Students also need to get enhanced by interchanging the ideas of them to an industry persons for which a platform of Entrepreneur development cell (EDC) is established, with this they can carve up the business ideas if any, and they can be encouraged for achieving them in reality if it is for the betterment of the society to move a step ahead and lead further in their future along with giving opportunities to many (Aleven & Koedinger, 2002).

Even after providing all the above amenities for the students to prove themselves to the best, some couldn't reach up to expectations, for bringing these students, so called slow learners up to the acknowledgment we implemented a new approach to handling remedial classes and bring them up to the satisfied outcomes.

The word "slow learner" is given to the undergraduate who has the capacity to achieve academically, but, tends to work under the evaluation level (Dasaradhi, Rajeswari & Badarinath 2016). Contrary to common acceptance, slow learners in the regular classroom are neither rare nor distinctive. The student commonly considered as a slow learner if he/she cannot learn at a standard rate from the institutional resources, textbooks, workbooks and learning sheets that are designed for the majority of students in the classroom. These students need special instructional wandering, frequent feedback, corrective instruction or adapted materials-all directed under conditions effectively flexible for learning to occur.

"Those who are slow to know suppose that slowness is the essence of knowledge"- Friedrich Nietzsche.

2. Characteristics of Slow Learners

Considering the aforesaid factors into implementation, characteristics of slow learners can be analytically listed out as below.

a)Limited Cognitive Capacity: The process of gaining knowledge related and insightful through it thoroughly based on experiences gives a clear idea of an individual. This is brought into practice as slow learners lack by unfolding the innate potentiality with which they fall short to overcome the reason for being the failure.

b)Poor Memory: Memory concept never understood completely by any till date, it is considered as one among the major problems for slow learners. Researchers define memory as the series, including recognizing and recalling an issue from the knowledge they have in any matter related to it. Each of this may affect learning, therefore time and special attention should be given for them to get the things to near about the perfection.

c) Distraction and Lack of Concentration: From person to person, interest towards a subject will differ, even though interested a slow learner may not accept the things more than 30 minutes in a perfect manner. Therefore, if the teacher controls or diverts the attention of a student after every 20 to 30

minutes when questions are posed for them, then there is a possibility for the student to be involved in the lecture.

d) Inability to Express Views: Few students come under slow learners as they need additional time to articulate their thoughts related to any solution because of their poor memory again. For them, if an educator can share ideas concerned to particular answer in a way relating the issue to the general day to life things so that he can store and regain the information required in a comfortable manner (Chauhan, 2011).

3. Edifying Programmes for Slow Learners

Educationists have recommended various educational programs to get through the predicament of slow learners from the mainstream. Most of the measures are surrounded by the scope of the teachers. The efficiency of certain measures has already been recognized by the researchers for students of this kind. A clear observation of the edifying program meant for slow learners will facilitate the teacher to combat slow learning in an effective manner.

The following are the remedial measures considered that includes the educational programs for the slow learners.

- **Motivation:** The word "motivation" can be described as "Encouraging for the desired to do something". Motivation can be applied to behavior in a variety of situations. One use of the concept of motivation is to describe a general tendency to strive towards certain types of goals. The success of any teacher,mainly depends on how successfully they encourage the students to learn. Experience has shown us that learning failure is very often largely due to poor motivation.

Slow learners by and large substantiate an attitude of avoiding which results from the previous experience of failure or dislike of a subject. They often glance at words rather than scrutinizing them carefully. Moreover, motivation not only instigates the behavior of the slow learner but also reinforces the ongoing behavior. Motivation makes the slow learners desirous of learning to apply them to the tasks.

- **Individual Attention:** It refers to the consideration given by the teacher to a particular student. Of all the students the slow learners need special attention from the teachers. If this is implemented, one can promote better human resource development.

- **Boosting of Self-Confidence:** Slow learners are the students who have experienced failure and as a result of which their sense of worth is seriously diluted. Constant lack of academic success, faulty instruction, and mismanagement by others lead to emotional disturbance, feelings of scantiness and conduct disorders.The breaking of this vicious becomes one of the most important objectives of remedial treatment. This cannot be broken unless something new is established as a special educational program for the slow learners. The educator should take all the possible efforts to make the opportunities to restore and develop self-confidence in slow learners which will definitely stimulate them into better realization.

- **Flexible Curriculum:** Authors' identified a basic assumption that underlies all curriculums: That knowledge was developed for one's own sake. If this curriculum is intended to meet the instant and long-term needs of the students, focusing on the content of subject areas, whereas the needs centerd curriculum assumes that human needs serve as the groundwork for curriculum.

The teachers should not lay much stress on the abstract and theoretical study as slow learners cannot understand the abstract concepts very easily. When there is a material presentation of any content, the slow learners will be able to understand the subject in a better way and this enhances their learning capability and to a significant amount (Chauhan, 2011).

The extreme challenge to an educationalist is to make out a slow learner. For which, authors have followed some methods by which each individual can be focused and monitored further. Thus, there is a developing need for help to remediate these students to make available to them the best possibilities in a changing world. Two similarities emerge when dealing with slow learners. The first is that entity should be concentrated with extra time. Secondly, each should be taken care with distinct perceptions.

4. Outcome-Aimed Strategies for Performance Improvement

From a general education point of view, there is an in progress movement to help students become "deliberate apprentices" who are capable of adjusting to new environments, integrate incongruent knowledge, and run-through continuous learning throughout their lives. For the past twenty years, practically all educationalists in the educational process have been challenging that the educational community constantly searches for improvements to student learning and success. Given the growth in willingly available knowledge, the assertion that technology is making information increasingly easy to access is also significant. This changing technology has had an important impact on pedagogy as students' behavior transform and adjust to modern-day certainties such as digital textbooks or e-textbooks.

Research indicates that students at all intensities, from preschool through college, enter instruction with various common sense, but incorrect interpretations of scientific and engineering concepts and skills. In addition, this paper builds on far-reaching review, rapid equity assessment for the betterment of students. Hence, this brief recognizes that 'one dimension does not fit all,' and aims to provide guidance to the institutions trying to evolve their particular solutions to the problem of weak student performance (Benjamin, A. S., & Tullis, J. 2010).

The purpose of this analysis is to identify and describe some interference to improve the performance of slow learners in engineering programs. This made us conduct the tests, both open & closed book tests (Green, FerranteB& Heppard, 2016), but the idea of open book test was grasping the time without giving the results and also our students didn't take it up to the mark (Agarwal, Karpicke, Kang, Roediger & McDermott, 2008). So the discussion started, ideas and views were considered separately from Head of the Department (HOD), Mentors, Senior and Junior staff members of EEE department of Guru Nanak Institute of Technology (GNIT). The thought behind it was to go to the roots of the problem of the students towards the examinations, thereby encouraging the students for understanding the subject.

Authors after meticulous discussion suggested for a SPECIAL DESCRIPTIVE TEST as a sort of practice and also to estimate the competence of the student. Department faculty suggested for retest so that slow learners who did not prove themselves in the SDT can perk up to some level. After this, the authors together concluded to go with SDT and Retests as per the syllabus covered. For a further process, mid marks along with attendance in the concerned subject is taken into consideration.

5. SDT & Retests

The first task of our well-planned scenario is to conduct the tests and sort out the required data. SDT is to be conducted after the completion of the first unit in the respective syllabus. These tests will be conducted for all the6 Subjects during the 6 days of a week in the respective hours. For this test to be effective, 3 sets of question papers are prepared to cover almost all the topics of a particular unit. Of which first set of the question paper is given to the student seated in the bench on the left corner followed by the other benches in a column, similarly second set of paper for the middle persons in a column and third for the right corner students of that particular column again. In the same way, it followed for the rest of the classroom.

For the students scoring 70% are considered to be good as they cleared the exam in the first attempt.

Students who fail in SDT and absent for the same are made to write the first retest covering almost one and a half unit. For this in order not to disturb the regular class work we planned for conducting it during the eighth hour (an extra hour) after college working hours. Now they need to score 75% of marks. Even now if the students are failing to score up to the expected percentage then they will be made to go with retest-2 and this time they need to prove by scoring 80%.After this conscientious process,students are filtered with all the above mentioned along with Attendance and mid marks, with the ones who could not clear these being considered slow learners.

The second big task in front of staff is to make this set of students clear their subject respectively. For this, authors planned for the remedial classes to be conducted for all the subjects by spending extra time for the students with this each slow learner can be concentrating more and improved further.

6. Case Study

Based on the authors' experience in teaching, monitoring students for so many years in technical engineering it is observed that they undergo stress related to completion of the syllabus, revision, and presentation of the same during the exams in the prescribed time with the best possible outcomes. Few students with less attention towards the subject need to be encouraged and some may have less grasping power compared to the other are to be counselled further.

For identifying the slow learners below steps were followed.

Step 1: Special descriptive test was conducted.

GNIT GURU NANAK INSTITUTE OF TECHNOLOGY – IBRAHIMPATNAM
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Date:

TIME TABLE FOR SPECIAL DESCRIPTIVE TEST-1

The below schedule is allotted for the special descriptive test -1, which need to be conducted as per the schedule strictly. Papers should be evaluated and submitted to the mentor within a week. Retest need to be conducted for absentees and for the students who will score less than 70% of marks.

II EEE

S.No.	Subject Name	Date	Day	Faculty Signature
1	Managerial Economics and Financial Analysis		Monday	
2	Switching Theory and Logic Design		Tuesday	
3	Power Systems-1		Wednesday	
4	Network Theory		Thursday	
5	Electrical Machines-II		Friday	
6	Electronics Circuits		Saturday	

III EEE

S.No.	Subject Name	Date	Day	Faculty Signature
1	Computer Methods in Power Systems		Monday	
2	Environmental Studies		Tuesday	
3	Disaster Management		Wednesday	
4	Microprocessors and Interfacing Devices		Thursday	
5	Electrical and Electronics Instrumentation		Friday	
6	Static Devices		Saturday	

IV EEE

S.No.	Subject Name	Date	Day	Faculty Signature
1	Fundamentals of HVDC and FACTS devices		Monday	
2	Renewable Energy Sources		Tuesday	
3	EHV AC Transmission		Wednesday	

HOD EEE

Figure 1.

As per the JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD (JNTUH) prescribed syllabus [1], there are 5 units to be covered for each subject for a period of 18 weeks. This test was conducted for the respective subject only after the completion of the first unit. The schedule had been prepared as per the below-given format which is for II Semester.

Step 2: Retest-1 and Retest-2 were conducted.

Further Retest-1 was conducted for the students who were absent and also who scored less than 70% in the SDT. Here the students are expected to score 75%. Retest-2 was conducted for the candidates who scored less than the prescribed, now they are accepted to be cleared with the process if they score a minimum of 80%.Else these students will be categorized as the slow learners. The format for the filtering the students by the three tests were made as below.

GURUNANAK INSTITUTE OF TECHNOLOGY
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Special Descriptive Test-1 Analysis

II-EEE

Total number of Students:

S.No	Subject	SDT-1			Retest-1				Retest-2			
		Date	No. of students present	No. of Students passed	Total strength	Date	No. of students present	No.of Students passed	Total strength	Date	No. of students present	No. of Students passed
1	MEFA											
2	STLD											
3	PS-1											
4	NT											
5	EM-II											
6	EC											

Figure 2.

Step 3: A variety of methodologies and approaches have been considered to measure students' theoretical understanding and their estimation of relating it to the practical along with their participation in the present day requirements, for which attendance along with concerned subject midmarks are taken into consideration.

GURU NANAK INSTITUTE OF TECHNOLOGY – IBRAHIMPATNAM
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

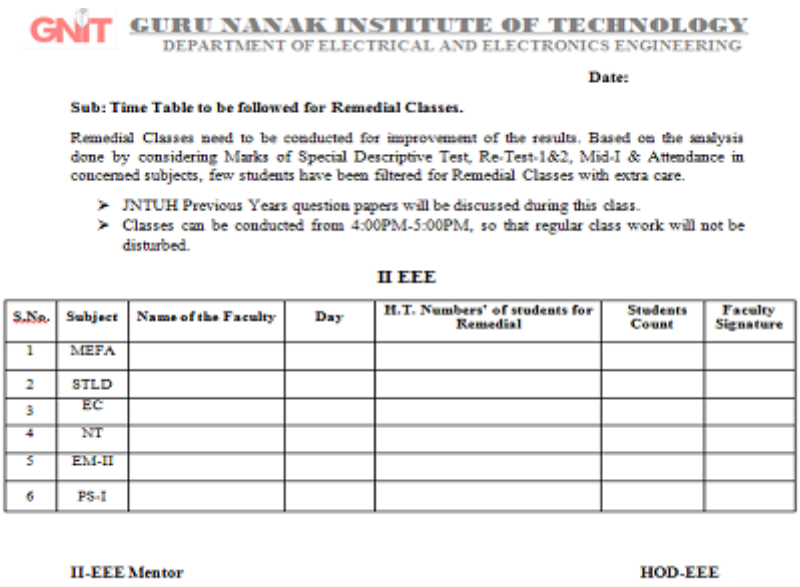
Date:

		Date of Exam	Date	Date	Date		Up to Date	
S.No.	H.T. No.	Name of the Student	SDT-1	RET-1	RET-2	MID-1	Attendance	REMARKS

Subject Faculty **Mentor** **HOD-EEE**

Figure 3.

A variety of teaching strategies are needed to help students refine or replace incorrect ideas and beliefs, possibly even in a single unit of instruction. Physics educational research has identified several approaches for successfully endorsing intangible change, including interactive lecture demonstrations, interventions that target specific misconceptions and "bridging analogies" that link students' correct understandings and the circumstances about which they harbour a fallacy (Equity Action Plan2011). Then initiated for conducting Remedial classes, an analysis was done again for the students who avail the college bus in order to avoid the disturbances of the concerned student to reach their homes.



GNIT GURU NANAK INSTITUTE OF TECHNOLOGY
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Date:

Sub: Time Table to be followed for Remedial Classes.

Remedial Classes need to be conducted for improvement of the results. Based on the analysis done by considering Marks of Special Descriptive Test, Re-Test-1&2, Mid-I & Attendance in concerned subjects, few students have been filtered for Remedial Classes with extra care.

- JNTUH Previous Years question papers will be discussed during this class.
- Classes can be conducted from 4:00PM-5:00PM, so that regular class work will not be disturbed.

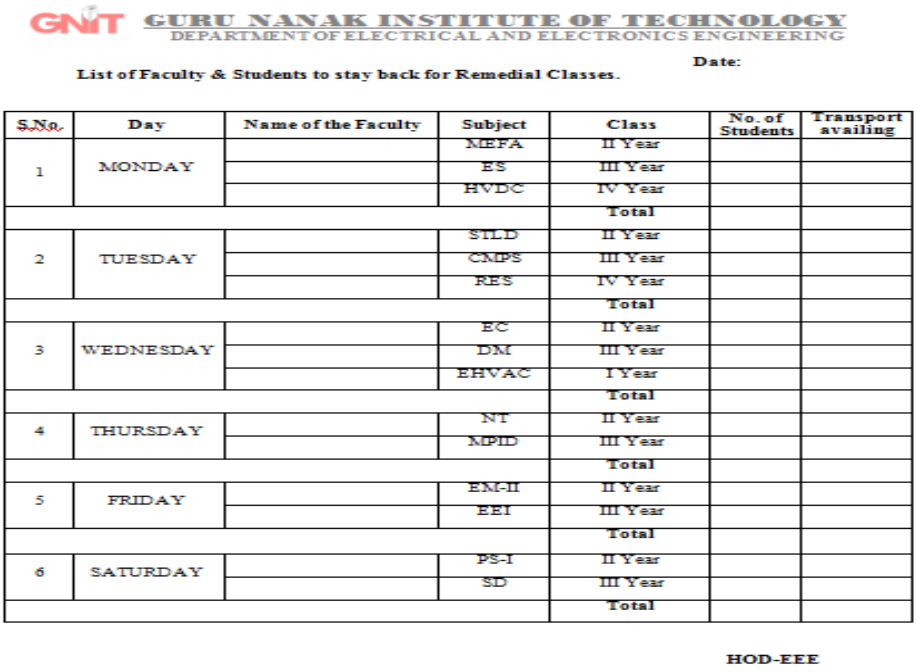
II EEE

S.No.	Subject	Name of the Faculty	Day	H.T. Numbers' of students for Remedial	Students Count	Faculty Signature
1	MEFA					
2	STLD					
3	EC					
4	NT					
5	EM-II					
6	PS-I					

II-EEE Mentor **HOD-EEE**

Figure 4.

Transport Facility: Transportation is arranged for faculty and students who stay back for remedial classes throughout the week. All measures are taken for the smooth running of the classes.



GNIT GURU NANAK INSTITUTE OF TECHNOLOGY
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Date:

List of Faculty & Students to stay back for Remedial Classes.

S.No.	Day	Name of the Faculty	Subject	Class	No. of Students	Transport availing
1	MONDAY		MEFA	II Year		
			ES	III Year		
			HVDC	IV Year		
				Total		
2	TUESDAY		STLD	II Year		
			CMPS	III Year		
			RES	IV Year		
				Total		
3	WEDNESDAY		EC	II Year		
			DM	III Year		
			EHVAC	I Year		
				Total		
4	THURSDAY		NT	II Year		
			MPID	III Year		
				Total		
5	FRIDAY		EM-II	II Year		
			EEI	III Year		
				Total		
6	SATURDAY		PS-I	II Year		
			SD	III Year		
				Total		

HOD-EEE

Figure 5.

Results achieved: After all practice, the authors concluded to go with the remedial classes for the overall improvement of students, in order not to disturb the regular class work for those candidates the classes were conducted during the extra hour. As a consequence of which the outcome was proved to be rising as shown with 4-1 Results as a sample.

Table 1.

S.No.	Batch	During Year	Overall pass %
1	2011	2014-15	61.19
2.	2012	2015-16	65.63
3.	2013	2016-17	67.74

The above-mentioned results are shown graphically

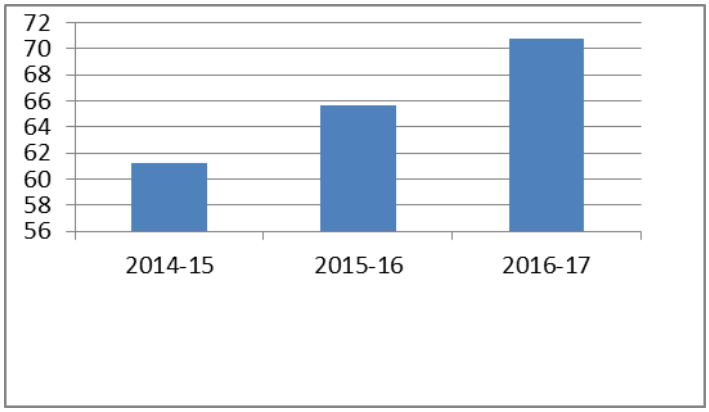


Figure 6.

6. Conclusion

"Practice makes man perfect", can be rewritten as "Practice makes Students' perfect", has been proved by our students' results, after the rigorous methods developed and followed by the faculty in terms of results academically. Furthermore, authors go all-out hard for the betterment of all the students in all the generations so that they can be well-through-out as the best human being to and for the society technically and in the non-technical way i.e. as an Engineer and a responsible citizen.

References

Agarwal, P. K., Karpicke, J. D., Kang, S. H. K., Roediger, H. L. III., & McDermott. (2008). *Examining The testing effect with open- and closed-book tests.* Retrieved from; http://psych.wustl.edu/memory/Roddy%20article%20PDF's/Agarwal%20et%20al%20(2008)_ACP.pdf

Aleven, V., & Koedinger, K. R. (2002). An effective meta cognitive strategy:Learning by doing and explaining with a computer based cognitive tutor.

Bednall, T. C., & Kehoe, E. J. (2011). *Effects of self-regulatory instructional aids on self-directed study*. Retrieved from; https://link.springer.com/article/10.1007/s11251-009-9125-6

Benjamin, A. S., & Tullis, J. (2010). *What makes distributed practice effective?* Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2930147

Equity Action Plan (2011). *Improving the Academic Performance of Weak Students.* Retrieved from http://www.npiu.nic.in/PDF/Mentoring%20and%20Audting/HImproving%20Performance%20of%20%20Weak%20Students.pdf

Green, S. G., Ferrante, C. J., & Heppard, K. A. (2016). *Using Open-Book Exams to Enhance Student Learning, Performance, and Motivation* . Retrieved from; https://eric.ed.gov/?id=EJ1092705

Dasaradhi, K., Rajeswari, S.R., & Badarinath, S. (2016). *30 Methods to Improve Learning Capability in Slow Learners*. Retrieved from; http://ijellh.com/wp-content/uploads/2016/03/60.Dasardhi-paper-final.pdf

Chauhan, S. (2011). Slow Learners: Their Psychology And Educational Programmes. Retrieved from http://www.zenithresearch.org.in/images/stories/pdf/2011/Dec/zijmr/22_VOL%201_ISSUE8_ZEN.pdf

Borah, R.R. (2013) .*Slow Learners: Role of Teachers and Guardians in Honing their Hidden Skills.* Retrieved from; https://www.ripublication.com/ijepa/ijepav3n2_04.pdf