



A Unique Approach For Assessment Combining The 3-2-1 Methodology Along With The Recent Developments In Assessment Techniques

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Abstract: Assessment techniques are typically used to assess student progress and adjust lesson plans. If some kids are developing more slowly than others, they can receive individualized instruction. If the entire class runs beyond schedule, the teacher can modify the curriculum. There are many techniques to assess a student's comprehension of the material. There are fundamentally two forms of evaluation: peer assessment, where students reflect on the work of their peers, and self-assessment, where students consider success factors connected to realizing their own objectives. This paper provides an overview of various assessment methods in addition to our suggested 3-2-1 strategy for student assessment and evaluation. We concentrate on the 3-2-1 strategy in this paper because some of them involve paper and pencil assessments and others ask students to give a thumbs up or down. 3-2-1 is a method of formative evaluation that aids students in determining what they have learned in class as well as how new information fits into their existing knowledge. It provides teachers with immediate feedback regarding their students' understanding so that you can make changes before the beginning of the next exam. The pupils can also discuss what they have learned and what they don't understand. It fosters open communication between students and teachers and increases mutual respect between them. Additionally, it assists you in identifying patterns and trends relating to your students' comprehension of the course material. The paper describes about 3-2-1 technique in section A, literature survey in section B, different techniques of assessment in C, proposed technique in D, Results and Discussion in E

Index Terms -formative assessment, feedback, pattern and trends, course material, 3-2-1 technique

I. INTRODUCTION

In the past, knowledge was considered as an individual process, and learning was approached as an instructional process. Simply put, it was a buildup of stimuli and response. Moreover, the assessment primarily tested fundamental knowledge. Most of them were multiple-choice, true-false, and required memorization of information rather than comprehension. These abilities were insufficient for the development of higher order cognitive abilities including reasoning, critical thinking, and problem-solving. Technology can help us redefine and imagine assessment in a variety of ways. For example, teachers can use real-time feedback to identify students' strengths and weaknesses. They can also ask students to solve real-world problems. Online assignment delivery can aid in students' continuous improvement. There are also many new trends in assessment techniques, such as concept maps, podcasts, muddiest point, think-pair-and-share memory matrices, and e-portfolios. Out of all these methods, we have suggested the 3-2-1 format assessment and demonstrated its advantages over the conventional one. These methods give pupils a profile for understanding and summarizing their education. Additionally, they assist teachers in re-identifying key areas of their instruction as well as the interests and backgrounds of their students.

II. LITERATURE SURVEY

Innovative assessment is also closely related to classroom processes, aiming to improve instruction practices and enhance learners' engagement (Marion et al., 2017). Digital technologies can improve the validity and reliability of assessment practices (Oldfield, Broadfoot, Sutherland & Timmis, n.d.). They can as well assist in combining formative and summative techniques (e.g. e-portfolios, learning analytics) and formats (e.g. self-, peer- or group assessment). Digital tools can moreover monitor students' learning in real time (OECD, 2016; Brauer & Siklander, 2017) [9] with increased personalization, flexibility and relevance to learners' interests and needs (Hofer, Duggan & Moellendick, 2018). An integrated approach can easily trace individual or group progress, aggregate evidence, comprehensively accumulate data, provide immediate feedback and make assessment more meaningful and authentic. Boud (Boud, 2007: 19 in Boud & Soler, 2016)[10] proposes that both educators and learners should engage in informed judgement, which refers to "the capacity to evaluate evidence, appraise situations and circumstances astutely, to draw sound conclusions and act in accordance with this analysis". An innovative approach should encourage self-reflection and

the development of certain dispositions for practice (e.g. working with peers, develop assessment criteria, engage in peer-assessment). The most traditional methods used were multiple choice test, short answers writing or essays. Simonson and others discussed the disadvantages of multiple choice tests. Creating a rubric might help grade the essays Simpsons 2000. Simonson and others, there are three approaches in alternative assessment: Authentic assessment, performance-based assessment, and constructivist assessment. Reeves (2000) suggests three main strategies to integrate alternative assessment into online learning settings: 1. cognitive assessment, 2. performance assessment, 3. portfolio assessment.[1]shows idea of the concept map with visual representation of topics and relationship between different ideas, words, concepts. Using arrows cause and effect, contribution between items, logical thinking is developed that divides complex ideas into smaller simple one's. In this technique the different assessment methods like concept maps, concept test's, portfolios, Podcasts and vlogs, Talk show performances are depicted and their benefits are also discussed[2].[3]In this the concept of think-pair-share is elaborated with think as teacher asking question, pair-as student pairing and share students discussing and sharing answer's.[4]Different formative assessment techniques like student's knowledge, their attitudes, skills, about subject, their weakness and strengths and learning ways as well as to check whether they require any special assistance or not by analyzing student's work, think-pair share, strategic questioning, classroom polls are described.[5]Muddiest point strategy along with its benefits and limitations are described. Different indirect and direct assessment techniques are described in this[6]. Different types of subjective and formative assessment along with the peer and self-assessment techniques are detailed in [11-20]

III. DIFFERENT TECHNIQUES OF ASSESSMENT

The different techniques of assessment are as follows-

3.1 Quiz Show

Quiz shows include a format of quiz shows such as students move through a series of questions which is most popular technique for introducing gaming mechanics like competition, points in classroom activity.

Drawback-It's not a good way of introducing concepts. A quiz might be just testing the user's interpretive and logical skills rather than knowledge acquired. Due to an probability of chance involved might restrict to complete understanding a user has gained.

3.2 Concept Mapping-

Visual representation between concepts students have learned. It is done by instructor to post an incomplete concept map and ask students to fill in blanks to complete concept map. It can be in form of flowchart, system mapping, hierarchy mapping,

Working strategy-

1. Select concept or theme you want students to start with
2. Identify keywords and key phrases, cluster concepts that are functioning at similar level of abstraction
3. Add 2-3 level of association if possible

Drawback-They can be overwhelming or messy when used to explore very large concepts. They create limitation to users which create vague concept maps. They can be more time-consuming as compared to other visualisation techniques.

3.3 Think-pair-share technique-

Faculty present a challenge or question student discuss and respond in pairs. It is sharing ideas in pair or group of 2. You can choose randomly a few pair of students to give 20-minute summaries of joint answers. Students are asked to compare and make contrast of ideas and explain why there ideas are different.

Drawback-

It does not easily to adapt to online environment. Monitoring this activity in class of more students is difficult as you want be to access every students contribution and give them immediate feedback. For some students talking to other students can create anxiety and affect student learning. You can't find out amongst students who shares ideas in group and whose are unmet. Students might waste time in small talk .In this case they should be monitored continuously.

3.4 Exit Tickets-These are small cards which students deposit as they leave the classroom.

Drawbacks-

Grading the exit tickets turns them into part of evaluation i.e. summative and not part of learning i.e formative. Assigning such kind of fast grading technique might decrease quantitative value.

3.5 Jigsaw puzzle-

It involves doing research in a subset of a given subject area and piecing the research with other students to build the whole picture. Identify concept areas having roughly 4-6 subtopics. Divide class into a team of 5-7 students. Assign each student a team of subtopics. Conclude with the whole class discussion.

Drawback-

It may take a long time for students to prepare students who work in groups. There might be one leader who may dominate other members.

3.6 One Minute Paper

It is a strategy that minimizes work on the part of the instructor. During these assessments students are given 1 minute to write responses to questions posed by the instructor.

Working Strategy-

1. Decide what teacher wants to focus on and where your students want to reflect on which topic
2. Share questions among students and after chosen topic is completed give scrap of paper to record their response.

3.7 Muddiest point

Muddiest point is simple classroom technique to find if anything is not clear or confusing to students. Here the teacher asks students to write down the answer to the question "What was the muddiest point addressed today?". Muddiest point gives learning experience when feedback is obtained specifically from group discussion. This technique can be used any time among students

Working strategy-

1. Determine what is feedback that you want. Reserve some minutes at the end of the session and collect responses from students. Respond to feedback of students during the next class.

Drawback-

It only sometimes focus on bad side of teaching. It is sometimes not easier for student to understand what they have not understood.

3.8 Focussed Listing-

Focus Listing focusses on only one term or concept or topic. Students provide various ideas related to one term concept or topic. This tells what students are able to recall from highlights of lesson.

It helps to how well learners can define or describe a central point and discover how well learners are connected with each other. Gauge the best initial point, class progress in learning one particular element of content of course.

3.9 Problem Recognition Tasks-

Identify some set of problems that can be solved by asking students by identifying by name which methods best fits problems without actually solving the problem.

3.10 Student generated questions for test-

A week or two before exam begin general guidelines for kinds of questions you are planning to ask in exam.

3.11 Memory Matrix-

It is simple 2-Dimensional matrix made up of rows and columns. It is used to organize information and relationships among concepts. Some cells are left blank and students are told to fill them.

D.PROPOSED TECHNIQUE-**3-2-1 Innovative Technique-**

This strategy provides students to record their own comprehension and summarize their learning. It gives opportunity identify areas that require reteaching, it helps in finding out interest of students, it also helps in finding out the background of students.

3-2-1 Technique-

Three-After lecture three things that they have learned.

Two-two things that they found interesting.

One-One question they have not understood about concept or lesson. In step one three things that were learned during the session, second step is two things which were interesting third thing is one muddiest point they found during session. 3-2-1 technique allows students to promote their thoughts and metacognition. This activity provides interest and students understanding.

How does it work-

1. 3- issues or ideas what was presented
2. 2- uses or examples how ideas can be implemented
3. 1- muddiest point

Innovative 3-2-1 ways-

1. Do 3-2-1 at the beginning of class and ask students to share 3-2-1 experience about the previous lecture.
2. Ask students to write 3-2-1 in complement a pre-class assignment
3. Ask students to complete on 3-2-1 focussed on syllabus, rubrics for assignment. This will clarify their ideas for future classes and refine the instructions for future classes.
4. Ask students to do 3-2-1 after each group presentation or individual presentation. It allows students to pay attention and offer feedback to their peers.
5. Ask students to give 3-2-1 feedback after new material is introduced. This gives information about refinement in lectures, examples, activity or slides. It would be useful if you deliver for the first time any activity in class.

Advantages-

1. Gives student one chance for self-modification before summative assessment
2. Embed reflective learning practise
3. Can guide teachers to understand lesson planning, which concepts need further review, learn what students enjoyed.
4. Provide feedback that can be applied immediately.
5. Allows students to share what they know and most important "what they don't know".

6. Creates a space which is open and safe to tell you what they don't know.
7. Decrease frustration as students are able to share feedback immediately.
8. Allows an opportunity for you to look for trends or patterns related to student material.

How it can be implemented-

1. Many tools like zipler help teachers to set questions and distribute to students
2. Get response to lectures, slides, examples so you can refine it
3. Do 3-2-1 at beginning of class. Ask students to share 3-2-1 to bridge gap between content from one class to another

Difference between 3-2-1- and One-Minute Paper Method—

Students are given 60 seconds at end of lecture or after completion of section of work for noting down anonymous responses with relation to that session of class. Then the students drop the responses in box and which will help teachers to get knowledge of students and gaps in their knowledge. The difference is 3-2-1 assessment is more organized way of implementing this technique with 3-take aways from lecture, 2-innovative ideas or applications and 1-muddiest point or drawback or concept they didn't understand. And most important is there is no time limit like one minute method where they would not find sufficient time to give their opinion. Also there are many ways to implement 3-2-1 assessment technique like You can focus on particular ideas of specific topic or main content taught in class. It can be implemented online through quizzes, games etc. It would be more fun loving. It helps to more clearly define learning outcomes, Select suitable ways of implementing 3-2-1 assessment and measure of it. It also accurately helps to analyze results of assessment. It helps teachers to adjust their content or teaching method according to learning outcomes.

End Users for assessment-

The teachers and students both will get benefit from this strategy since teachers can evaluate students' performance after every lecture and correct way of teaching also what are difficulties or challenges faced by students while learning topic can be focused. It also highlights the application or innovative thinking of students. It broadly encompasses on the opinion of students which highly helps teacher to improve performance according to students feedback during classroom itself. Students' thinking capability and their interest about certain topic can be found out. This course can work for all BE and BTECH students from Multidisciplinary Engineering like Mech, Civil, from Modern Engineering like Computer Engineering, Information Technology, Electronics and Computer Science, Electronics and Telecommunication Engineering, also for Emerging Technology like AI, ML, IOT, etc. It can also be used for Vocational students

Outcome of 3-2-1 Technique-

3-2-1 technique helps teachers to frame a particular topic or task. It would be useful as discussion based learning. It would help students to summarize their learning and comprehend their views. It helps students and teachers to identify what they learnt and not learned during lectures.

E. RESULTS AND DISCUSSION

We have discussed results taken from survey among students of **TE computer from Thakur College of Engineering, Kandivali East** and put down in graphical form. We have put down some questions related to subject which was "**Theory of Computer Science**" and asked students about 3 take aways from lecture 2 interesting things or applications and 1 muddiest point or difficulty they found from the lecture. Accordingly we have put down statistical results which shows different advantages over other methods.

We have asked students to write 3-2-1 about a topic by share their ideas in small groups or in pairs. We have taken following responses to guide teachers in teaching process and check whether any revisions can be made in teaching methodology or contents which were taught to students. That is which are areas which required to be reviewed again or concepts which are most interesting for students. Then the result of 3-2-1 technique were discussed among students.

Challenges faced by teacher while using 3-2-1 strategy-

Major challenges that teacher faced during the implementation of 3-2-1 technique are-

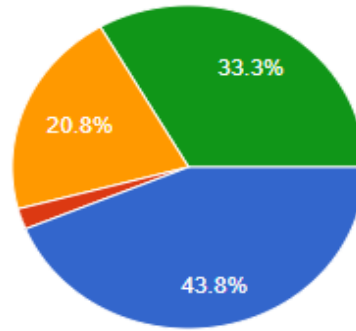
1. Time Management for implementing technique and gathering responses
2. Lack of proper training for carrying out this strategy
3. Tampering or copying of responses can affect collection of appropriate information from student's
4. There should be some standardized ways of testing this technique as different students may learn the same subject in different manner and similar would happen when teacher's are evaluating them

This are the responses that we got for few questions of survey we circulated among TE Computer students-

1.

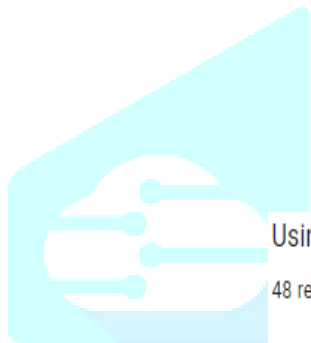
Given a chance what is one change would you like to see ?

48 responses



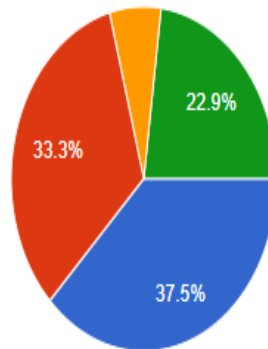
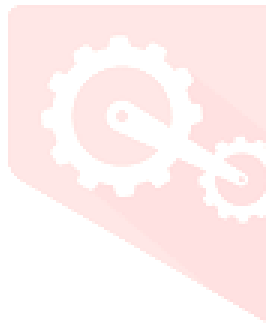
- Create co-operating learning technology
- Jigsaw puzzle
- Invite a guest speaker ,go on field trip
- All of above

2.



Using 3-2-1 strategy what motivates students to learn more?

48 responses

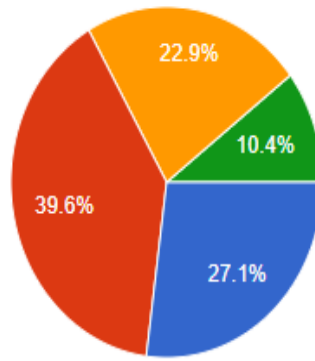


- Asking many questions to teacher
- Completing different assignments
- Performing Sports and Extra circular activities
- Other activities

3.

How many hours student spend on learning

48 responses

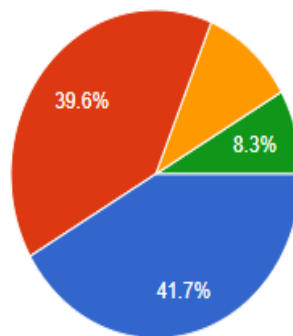


- <2 Hours
- 2-3 Hours
- 3-4 Hours
- 2Hours

4.

Does your teacher encourage you to perform better?

48 responses

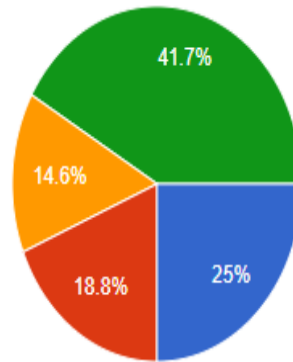


- All times
- Sometimes
- Not at all
- Sometimes yes Sometimes no

5.

What are benefits of 3-2-1 strategy?

48 responses

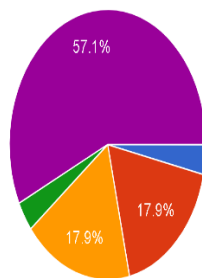


- give student chance for self modification before going for summative assesment
- Reflective learning is embedded
- Teachers can get guidance for lesson planning, what concepts require further review also learn about what students enjoyed
- All of above

These are responses we got from BE students for Storage of Area Networks elective subject-1.

Different ways of implementing 3-2-1 assessment techniques?

28 responses

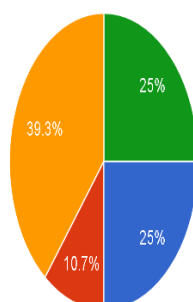


- Get students' immediate response to the slides, lecture, examples, discussion, activity, etc. so you can refine it as ne...
- Ask students to share their 3-2-1 about the previous lecture to help bridge the...
- Ask students to complete a 3-2-1 focused on the syllabus, a rubric, or th...
- Ask students to complete a 3-2-1 after each group presentation (or individual...
- All of above

2.

What are benefits of 3-2-1 strategy?

28 responses

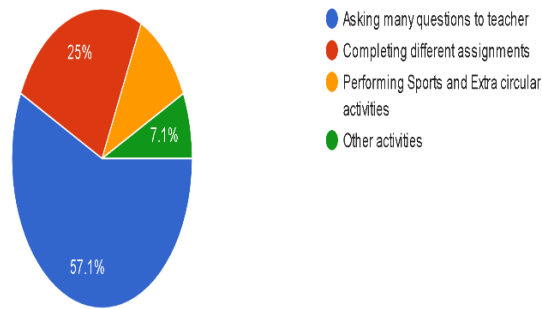


- Creates a safe and open space for students to share feedback
- Reflective learning is embedded
- Allows your students to share what they know - and more importantly what they don't know
- Gives you immediate feedback so you can make adjustments early in the course

3.

Using 3-2-1 strategy what motivates students to learn more?

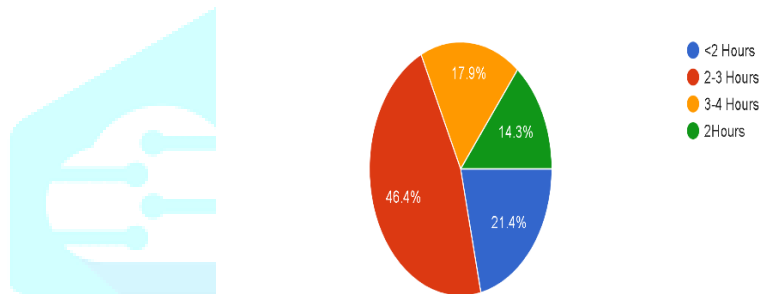
28 responses



4.

How many hours student spend on learning and assessment?

28 responses



Suggestions from students-

1. Students would write down 3 things that they think might happen during an experiment or topic when taught. Then they would write down 2 things that really happened and the 1 box would be where students would write a question that they might have about the topic.
2. Group discussion on topic taught, question answer session
3. Spend 3 minutes summarizing, 2 minutes clarifying, and 1 minute writing sentence that concisely summarizes the topic.
4. Ask students to complete a 3-2-1 focused on the syllabus, a rubric, or the instructions for an assignment
5. Discussion in class among students and teacher

F. IMPACT ANALYSIS OF 3-2-1 ASSESSMENT

It gave teachers a simple way to assess pupils' comprehension and determine their level of interest in a subject. It gives them a framework to track their own understanding and condense their learning. It offers teachers a variety of teaching methods, removing the monotony from the process. It offers pupils a variety of learning opportunities. Teachers utilize the results of the 3-2-1 exit tickets after reviewing them to gauge student comprehension.

It was helpful to summarize several important concepts, give students time to reflect so they could concentrate on the ones that most intrigued them, and then ask a question to see where their comprehension was still unclear. It has improved the standard of teachers' feedback to students. With the help of this kind of examination, many concepts that were unclear during class sessions became evident.

Result & PO Attainment—

TOOLS ↓ \ PO →	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
In-Semester Assessment	1.44	1.8	1.3	0.9								0.66	2.14	1.37	
End Semester Exam	1.5	1.96	1.51	0.69								0.78	2.27	1.47	
Formative Assessments	1.73	2.26	1.69	0.83								0.86	2.56	1.7	
Practical	1.79	2.32	1.74	0.87								0.87	2.62	1.74	
Course Survey	1.75	2.26	1.70	0.85								0.85	2.55	1.70	
Average Attainment	1.64	2.12	1.59	0.83								0.80	2.43	1.60	

fig1. co-po attainment in year 2022-23 in TCS subject done under above survey

Academic Year: 2022-23		SEMESTER: VI				Class: TE				Subject: MP				Mode: H, M, L				6-1-22			
TOOLS ↓ \ PO →	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4					
In-Semester Assessment	2.02	2.02	1.75	1.03								1.8	2.02	1.03							
End Semester Exam	1.29	1.04	1.78	1.53									1.99	1.77							
Formative Assessments	1.55	1.23	1.95	1.86									2.34	1.34							
Practical	0	0	0	0									0	0							
Course Survey	1.65	1.31											2.57	1.89							
Average Attainment	1.30	1.12	1.50	1.26									1.80	1.21							

fig2. co-po attainment for TCS subject in year 2021-22

Average CO-PO Attainment for year 2022-23 was more for most of the PO's as compared to that of academic year 2021-22

G. CONCLUSION

Thus we have seen that 3-2-1 approach provides more-learner centric, skill based, multiway transfer and knowledge based, interactive engaging, conceptual and practical assessment as compared to other assessment techniques. It helps teachers to get immediate feedback after lecture so that they can plan next session accordingly. It also allows students to tell what they don't know before they fall too behind. It also helps to build a free open space and let student's think that teacher's care about student's success too. Decreasing the frustration, building course material after looking for pattern and trends from student's responses and giving student's voice in the process are some of major advantages of using 3-2-1 strategy.

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