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Abstract

Formative assessment is a range of formal and informal assessment procedures employed by teachers during the learning process in order to modify teaching and learning activities to improve student attainment. Formative assessment is more valuable for day-to-day teaching when it is used to adapt the teaching to meet students' needs. Formative assessment helps teachers to monitor their students' progress and to modify the instruction accordingly. It also helps students to monitor their own progress as they get feedback from their peers and the teacher. In mathematics education, formative assessment is diagnostic. To employ formative assessment in the classrooms, a teacher has to make sure that each student participates in the learning process by expressing their ideas; there is a trustful environment -in which students can provide each other with feedback; she/he (the teacher) provides students with feedback; and the instruction is modified according to students' needs.

key word : Teaching and learning activities, formative assessment, mathematics education

It typically involves qualitative feedback rather than scores for both student and teachers that focuses on the details of content and performance. It is commonly contrasted with summative assessment, which seeks to monitor educational outcomes, often for purposes of external accountability.

Formative Assessment is a basic need for the Continuous and Comprehensive Evaluation (CCE). Now a day's CCE is incorporated in school assessment as well as college assessment so, it is very important to know about the conceptual understanding of formative evaluation.

Definition : Black and William (2003) give the definition of formative evaluation, all those activities undertaken by teachers, and/or by students, which provide information to be used as feedback to modify the teaching and learning activities in which they are engaged. Is called Formative Evaluation. Along similar lines, Cowie and Bell (1999) define formative assessment as the process used by teachers and students to recognize and respond to student learning in order to enhance that learning, during the learning. Nicol and Macfarlane-Dick (2006), who emphasize the role students can play in producing formative assessments state that "formative assessment aids learning by generating feedback information that is of benefit to students and to teachers. Feedback on performance, in class or on assignments, enables students to restructure their understanding/skills and build more powerful ideas and capabilities. Formative assessment is not distinguished by the format of assessment, but by how the information is used. The same test may act as either formative or summative. However, some methods of assessment are better suited to one or the other purpose.

Origin of the term : Michael Scriven (1967) coined the terms formative and summative evaluation in 1967, and emphasized their differences both in terms of the goals of the information they seek and how the information is used. For Scriven, formative evaluation gathered information to assess the effectiveness of a curriculum and guide school system choices as to which curriculum to adopt and how to improve it. Benjamin Bloom (1968) took up the term in the

book Learning for Mastery to consider formative assessment as a tool for improving the teaching-learning process for students. His subsequent 1971 book Handbook of Formative and Summative Evaluation, written with Thomas Hasting and George Madaus, showed how formative assessments could be linked to instructional units in a variety of content areas.

For both Scriven and Bloom, an assessment, whatever its other uses, is only formative if it is used to alter subsequent educational decisions. Subsequently, however, Black and William have suggested this definition is too restrictive, since formative assessments may be used to provide evidence that the intended course of action was indeed appropriate.

They propose that Practice in a classroom is formative to the extent that evidence about student achievement is elicited, interpreted, and used by teachers, learners, or their peers, to make decisions about the next steps in instruction that are likely to be better, or better founded, than the decisions they would have taken in the absence of the evidence that was elicited.

Purpose of Formative Assessment : There are several purposes to formative assessment:

To provide feedback for teachers to modify subsequent learning activities and experiences; [Huhta, Ari 2010]

To identify and remediate group or individual deficiencies; [Huhta, Ari 2010]

To move focus away from achieving grades and onto learning processes, in order to increase self efficacy and reduce the negative impact of extrinsic motivation; [Shepard, Lorrie 2005]

To improve students' metacognitive awareness of how they learn. [Shepard, Lorrie 2005]

"Frequent, ongoing assessment allows both for fine-tuning of instruction and student focus on progress." [Cauley, K, M.; McMillan, J. H. 2010]

Feedback is the central function of formative assessment. It typically involves a focus on the detailed content of what is being learnt,[2] rather than simply a test score or other mea-

measurement of how far a student is falling short of the expected standard. [Nicol, David; et al. 2005]

Nicol and Macfarlane-Dick (2005), synthesizing from the literature, list seven principles of good feedback practice: It clarifies what good performance is (goals, criteria, expected standards);

It facilitates the development of self-assessment in learning; provides high quality information to students about their learning; encourages teacher and peer dialogue around learning; encourages positive motivational beliefs and self-esteem, provides opportunities to close the gap between current and desired performance, provides information to teachers that can be used to help shape teaching. [Nicol, David; et al. 2005]

Students also find opportunity to revise and refine their thinking by means of formative assessment. Formative assessment is also called as educative assessment and classroom assessment.

Methods of Formative Assessment : There are many ways to integrate formative assessment into K–12 classrooms. Although the key concepts of formative assessment such as constant feedback, modifying the instruction, and information about students' progress and do not vary among different disciplines or levels. The methods or strategies may differ. For example, researchers developed generative activities (Stroup et al., 2004) and model-eliciting activities (Lesh et al., 2000) that can be used as formative assessment tools in mathematics and science classrooms. Others developed strategies computer-supported collaborative learning environments (Wang et al., 2004b).

Formative Assessment in Mathematics Education : it is really important for teachers to see how their students approach the problems and how much mathematical knowledge and at what level students use when solving the problems. That is, knowing how students think in the process of learning or problem solving makes it possible for teachers to help their students overcome conceptual difficulties and, in turn, improve learning. In that sense, In math classes, thought revealing activities such as Model-Eliciting Activities (MEAs) and generative activities provide good opportunities for covering these aspects of formative assessment. Formative assessment in Second/ Foreign Language Education. As an ongoing assessment it focuses on the process, it helps teachers to check the current status of their students' language ability, that is, they can know what the students know and what the students do not know. It also gives chances to students to participate in modifying or replanning the upcoming classes (Bachman & Palmer, 1996). Participation in their learning grows students' motivation to learn the target language. It also raises students' awareness on their target languages, which results in resetting their own goals. In consequence, it helps students to achieve their goals successfully as well as teachers be the facilitators to foster students' target language ability. In classroom, short quizzes, reflection journals, or portfolios could be used as a formative assessment (Cohen, 1994).

Formative Assessment in Elementary Education : In primary schools is used to inform the next steps of learning. Teacher and students both use Formative Assessments as a tool to make decisions based on data. Formative assessment occurs when teachers feed information back to students in ways that enable the student to learn better, or when students can engage in a similar, self- reflective process. The evidence shows that high quality formative assessment does have a powerful impact on student learning. Black and William (1998) report that studies of formative assessment show an effect size on Standardized Tests of between 0.4 and 0.7, larger than most known educational interventions. (The effect size is the ratio of the average improvement in test scores in the innovation to the range of scores of typical groups of pupils on the same tests; Black and William recognize that standardized tests are very limited measures of learning.) Formative assessment is particularly effective for students who have not done well in school, thus narrowing the gap between low and high achievers while raising overall achievement. Research examined by Black and William supports the conclusion that summative assessments tend to have a negative effect on student learning.

Formative Assessment in UK education : In the UK education system, formative assessment (or assessment for learning) has been a key aspect of the agenda for personalized learning. The Working Group on 14–19 Reform led by Sir Mike Tomlinson, recommended that assessment of learners be refocused to be more teacher-led and less reliant on external assessment, putting learners at the heart of the assessment process.[Jones, Dr Cheryl A 2005]

The UK government has stated [2005] that personalized learning depends on teachers knowing the strengths and weaknesses of individual learners, and that a key means of achieving this is through formative assessment, involving high quality feedback to learners included within every teaching session.[Duckett, Ian and Brooke 2007]

The Assessment Reform Group has set out 10 principles for formative assessment.[26] These are that assessment for learning should be part of effective planning of teaching and learning, focus on how students learn, be recognized as central to classroom practice, be regarded as a key professional skill for teachers, be sensitive and constructive because any assessment has an emotional impact, take account of the importance of learner motivation, promote commitment to learning goals and a shared understanding of the criteria by which they are assessed, enable learners to receive constructive guidance about how to improve, develop learners' capacity for self-assessment so that they can become reflective and self-managing and recognize the full range of achievements of all learners.

Benefits of Formative Assessments for Teachers (Boston, Carol 2002)

Teachers are able to determine what standards students already know and to what degree. Teachers can decide what minor modifications or major changes in instruction they need to make so that all students can succeed in upcoming

instruction and on subsequent assessments. Teachers can create appropriate lessons and activities for groups of learners or individual students. Teachers can inform students about their current progress in order to help them set goals for improvement. In 2008, Katy Bainbridge began work on Align Assess Achieve, a method of teaching formative assessment to administrators and teachers.

Benefits of Formative Assessments for Students [Marzano, 2003] [Stiggins, et al., 2006]

Students are more motivated to learn. Students take responsibility for their own learning. Students can become users of assessment alongside the teacher. Students learn valuable lifelong skills such as self-evaluation, self-assessment, and goal setting.

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