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Assessment methods and their impact on learning outcomes in education

Los métodos de evaluación y su impacto en los resultados del aprendizaje en la educación

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Abstract

This article takes a look at the various ways through which assessment is conducted in education and how these methods have impacted the learning outcomes of students. There are two major approaches that have taken center stage: formative and summative assessment. While formative assessment is a continuous process, informing students of feedback that allows them to monitor, identify, and correct their mistakes during the learning process, summative assessment measures the knowledge attained at the end of a given academic period. Quantitative analysis of results from 300 students, through a mixed-methods approach, together with qualitative interviews with teachers, indicates that students who consistently go through formative assessments have an average gain in scores of 12%, while the average improvement for students who are majorly subjected to summative assessments is 6%. It is for this reason that such findings have stressed the need for integration of formative assessment as an integral strategy that could help improve learning outcomes, rather than having the dependence solely on summative assessments.

Keywords: assessment methods, formative assessment, summative assessment, learning

outcomes, educational impact

Resumen

En este artículo se analizan las distintas formas de evaluación en el ámbito educativo y cómo estos métodos han influido en los resultados de aprendizaje de los estudiantes. Hay dos enfoques principales que han cobrado protagonismo: la evaluación formativa y la sumativa. Mientras que la evaluación formativa es un proceso continuo que proporciona a los estudiantes retroalimentación que les permite controlar, identificar y corregir sus errores durante el proceso de aprendizaje, la evaluación sumativa mide los conocimientos adquiridos al final de un período académico determinado. El análisis cuantitativo de los resultados de 300 estudiantes, mediante un enfoque de métodos mixtos, junto con entrevistas cualitativas a profesores, indica que los estudiantes que se someten sistemáticamente a evaluaciones formativas tienen una mejora media de las puntuaciones del 12%, mientras que la mejora media de los estudiantes que se someten principalmente a evaluaciones sumativas es del 6%. Es por ello que estos hallazgos han puesto de relieve la necesidad de integrar la evaluación formativa como una estrategia integral que podría ayudar a mejorar los resultados de aprendizaje, en lugar de depender únicamente de las evaluaciones sumativas.

Palabras clave: métodos de evaluación, evaluación formativa, evaluación sumativa, resultados de aprendizaje, impacto educativo

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INTRODUCTION

Assessment is one of the most important features in education, for it determines and shapes teaching and learning. Not only does assessment measure the progress of students, but it also provides invaluable feedback for educators in developing and revising their instruction methods. Overall, there are mainly two kinds of assessment: formative and summative. Each has a different role in the educational systems and contributes differently to the learning experience and outcomes. This paper discusses the impact of the method of assessment on student learning outcomes in regard to the balance between formative and summative assessments and the relative impact each one has on learning progress.

The main task of education is student learning and development. Assessment occupies an exceptionally important place in this respect. It helps educators measure how effective their teaching strategies are, while students may gauge their comprehension and progress. Hitherto, the role of assessment has massively undergone an evolutionary process through a paradigm shift from the traditional summative evaluation mode to a more progressive formative assessment. The shift is premised on the belief that learning is a continuous process, therefore benefiting from ongoing feedback, rather than some final judgment delivered at the end of a course or semester. This shift is supported by those scholars who argue that formative assessments provide immediate feedback that guides the learner in correcting misunderstandings during the learning process (Black y Wiliam, Assessment and Classroom Learning, 1998).

Evolution of Assessment in Education

Throughout history, summative assessments have dominated assessments in education. In most cases, summative assessments take the form of final exams, standardized tests, or projects designed to measure a student's cumulative knowledge. These results of assessment are then used to determine what the next course the student will embark on in his or her academic career, including decisions such as to advance a grade, graduate, and qualify for scholarships (Hailikari et al., 2007). This model of assessment has been criticized on many grounds: it encourages rote memorization, and there is no immediate feedback to aid improvement during the learning process.

Summative assessments, although still in extensive use, have started to be balanced out with formative assessments. Formative assessment focuses on continuous feedback in the course of learning and allows both the student and teacher to realize areas that need improvement during an early stage. According to (Shute, 2008), formative assessment can occur as quizzes, in-class exercises, peer reviews, and discussions. Most importantly, formative assessment is not meant to assign grades but to provide beneficial feedback to modify the learning aspects.

Formative and Summative Assessment: A Comparative Overview

Formative assessment is often referred to by many as "assessment for learning" since it is a practice applied to informing both students and teachers about the progress achieved with regard to the attainment of learning goals. These assessments are generally low stakes and are intended to facilitate the learning process via the provision of timely, specific feedback. Research has shown that when students receive feedback from the formative assessments, they have a tendency to be reflective in their thinking, hence changing their way of studying and having improved academic results (Hattie y Timperley, The Power of Feedback, 2007).

In contrast, summative assessments are also referred to as "assessment of learning"; they are normally administered at the end, and their only objective is to ascertain how a student has fared at a particular moment in time, usually at the conclusion of a course or academic term. Summative assessments are often high-stakes in that the repercussions that students are likely to face if they fail are always critical, including failing to get good grades or advancing to the subsequent class. Although summative assessments carry a lot of weight regarding giving an overall picture of the achievement

of learners, they simply cannot serve as effectively for growth and improvement purposes as formative assessments are able to.

Comparative research on formative and summative assessments repeatedly shows the effects of formative assessment on student learning outcomes outperform those from summative assessment. For example, (Black y Wiliam, Assessment and Classroom Learning, 1998) conducted a meta-analysis in 1998. The authors found that formative assessments raised student achievements from various subjects and grade levels. According to the authors, the students' achievement could be raised by as high as an average of 25 percent with the use of formative assessment. This notion was so because the formative assessments offer ongoing feedback, which aids students in making immediate adjustments in their learning strategies.

The Role of Feedback within Formative Assessment

Feedback is the next vital component of any formative assessment, having also been widely touted as one of the most potent influences on student learning (Hattie, 2008). Effective feedback is information given to students concerning how they have gone wrong, what they have done well, and how they might improve. Specific, timely, and actionable feedback is more likely to improve learning achievements than is vague or late feedback (Sadler , 1989).In the context of formative assessment, feedback guides teachers and students in making adjustments in teaching and learning strategies.

Indeed, other research also supports the effectiveness of feedback in formative assessments, noting that feedback is most effective if it is goal-directed, task-specific, and presented to students in a manner that encourages them to reflect upon their own learning. Furthermore, feedback that centers on effort and strategies rather than intelligence or innate ability is more likely to foster a growth mindset among students; this has been associated with increased motivation and academic achievement in general.

Challenges of Formative Assessment

With all the apparent benefits derived from formative assessment, they are not devoid of certain drawbacks. One of the major concerns is how much time and effort the tutors actually have to give useful feedback to students. To prove their worth in a formative assessment, these have to be timely, specific, and actionable, which again is quite difficult to achieve in a large classroom or under resource constraint conditions (Nicol y Macfarlane-Dick, 2006). On top of that, some teachers are also not well-trained in how to carry out formative assessments, thereby making them give less effective feedback to students.

Other challenges include the perceived lack of rigor in formative assessment. Some educators and policymakers view formative assessment practices as lacking in both validity and reliability when compared to summative assessment because of the very nature of its being low-stakes and not necessarily designed to fit into one particular format of standardized testing. Conversely, the greatest strength of formative assessment, according to its advocates, is that it enhances learning through deeper understanding, as opposed to mere recall of information by students (Stiggins, 2002).

Integrating Formative and Summative Assessments

s Given the strengths and weaknesses of both formative and summative assessments; many education experts have called for a balanced approach to assessment that incorporates both types of assessment. Instead of looking at formative and summative as assessments that serve entirely different purposes, they can be complimentary to one another in enhancing student learning and achievement (Hailikari et al., 2007). For example, formative assessment might be provided throughout a course to offer feedback and a chance for improvement, whereas summative assessments might be employed at the end of a course to make judgments about overall achievement.

Another positive influence of a balanced approach to assessment could be mitigation of some

challenges associated with each type of assessment. For example, formative assessment may help learners get those skills and knowledge that shall be needed for successful completion of summative assessments; summative assessments will then produce a final record of the extent to which students have mastered the material. Together, these two kinds of assessments-formative and summative-allow educators to give a more complete picture about student learning (Pellegrino et al., 2001).

Research Questions and Hypotheses

This study will try to find out the answers to the following questions:

To what extent do the results of formative assessments differ from summative assessments in view of student learning outcomes?

How much does feedback apply to enhance the power of formative assessment?

To what degree is the integration of formative and summative assessment best utilized in order to maximize their influence on student learning?

From these research questions, a set of hypotheses has been developed as follows:

Hypothesis 1: The mean difference in student learning outcomes of the students who receive formative assessments will be greater than that of the students who are receiving summative assessments.

Hypothesis 2: Feedback is an integral component in making the process of formative assessment effective.

Hypothesis 3: A judiciously balanced approach that combines both formative and summative assessments will yield maximum benefits in terms of student learning outcomes.

METHODOLOGY

In this study, a mixed-methods research design is adopted in an attempt to investigate how the utilization of different assessment methods, specifically formative and summative assessment, influences students' learning outcomes. The research study combines quantitative and qualitative methods with the view of getting as much information as possible on how these two kinds of assessment influence the academic performance of students. Precisely, the study explores how different formative assessments, which are to be continuous and based on feedback, are from summative assessments, which usually are reserved to evaluate learners' total accumulation of knowledge at a terminal period. The methodology information involves the description of research design, sampling population, data collection procedures, instruments used, and data analysis techniques.

2.1 Research Design

In this mixed-method approach, quantitative data from standardized tests will be complemented by qualitative data from teacher interviews, hence offering a far finer grain of details on such impacts. This is where triangulation could occur in this approach, further enhancing validity and reliability through cross-verification from different sources (Creswell y Creswell, 2014). The period the study covered was one academic semester, during which students would be exposed to both formative and summative assessments. The present research will, therefore, contrast and compare the academic progress of students subjected to continuous assessment and those who are subjected to summative assessment at the end of the term, in order to identify which assessment methodology has proved more effective in enhancing learning outcomes.

Sample Population

The research had been carried out in one of the schools in Ecuador, with a sample size of 300 students within the age brackets of 14-16 years, corresponding to grades 9 through 12. The sample size was

selected using stratified random sampling in order to get a representative sample across genders and socio-economic backgrounds, as well as across levels of school performance. The school follows the standard curriculum, which includes formative and summative assessments as part of its teaching methodology.

Sample Size: 300 students

Gender: Male (52%), Female (48%)

Age: 14-16 years

Socioeconomic Status: Low to middle-income families

Grade Levels: 8th to 3rd high-school grade

In addition, 15 teachers from different subjects were interviewed to explore qualitatively teachers' experiences of both formative and summative assessments. The interviews explored teachers' perceptions of how these assessment types influence students' learning and how teachers themselves use the feedback they receive in their teaching.

2.3 Data Collection

Data collection consisted of two phases: quantitative data collection through standardized tests and qualitative data through semi-structured interviews.

2.3.1 Quantitative Data: Standardized Tests

A set of tests was administered to the students during the semester. Tests ranged from formative assessment, such as quizzes, homework, and in-class activities, to summative ones in such forms as midterm and final exams. The main goal of the research was to trace the progress of students who had undergone various types of assessment. Testing in every subject area was aligned with the national curriculum and covered mathematics, science, English, and social studies.

Quantitative data will be based on standardized tests aimed at measuring gains or improvement in the performance of students over time. These will be formative assessments that have to be conducted to provide ongoing feedback; summative assessments will be needed at the end of the semester to summarize achievement.

Table 1

Below shows the number of formative and summative assessments conducted per subject area

Subject Area	Number of Formative Assessments	Number of Summative Assessments
Mathematics	5	2
Science	4	2
English	6	2
Social Studies	5	2

Qualitative Data: Teacher Interviews

The data in this study are qualitative, collected through semi-structured interviews with 15 teachers. Each interviewee was interviewed face-to-face for 30-45 minutes. The interview questions were designed to capture how teachers normally apply formative assessment in the classroom and their perception of how summative assessment has impacted the learning outcomes of their students. Qualitative data set context to the quantitative results but also gave an understanding of the benefits and challenges that different assessment methods present.

The following guiding questions were used in the interviews:

How do you integrate formative assessments into your teaching?

What type of feedback do you provide to students, and how often?

In your opinion, how do summative assessments affect students' learning?

What challenges do you face in implementing formative assessments?

Instruments

Two key instruments for the current study are standardized test results and interview protocols.

Standardized Tests: These were performed based on the curriculum design at school and also included the instructions of the national standards. The test worked for knowledge assessment in core subject areas at various junctures throughout the semester. While formative assessment provided continuous measures of learning progress, summative ones calculated overall achievement at the end of the semester.

Interview protocol: A semi-structured interview guide was prepared to explore teachers' perspectives on the methods of assessment applied. The recordings of the interviews were transcribed and then coded for analyses by thematic analysis methods.

Data Analysis

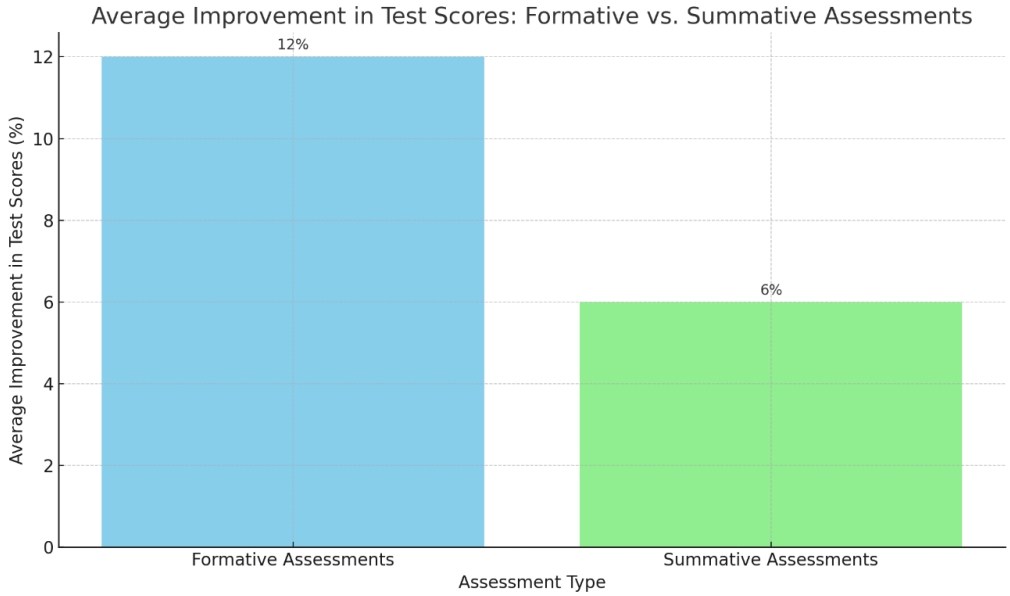
The data analysis was conducted in two phases—quantitative analysis of the test scores and qualitative analysis of the interview data.

Quantitative Data Analysis

Quantitative data on students' performance in both formative and summative assessments were summarized using descriptive statistics: mean, standard deviation, and percentage. Further, paired t-tests, a kind of inferential statistics, were conducted to establish how the mean improvement for students who had formative and summative assessments compared. The level of significance was considered at $p < 0.05$.

Graphic 1

Below shows the average gain in test scores of students subjected to formative against summative assessment



As presented in the figure, the improvement of the students who were given a chance to take more frequent formative assessments was 12%, while that of students who were mostly assessed through summative methods was 6%.

Qualitative Data Analysis

- Qualitative Data In the case of interview data obtained from teachers, thematic analysis was conducted. The interview transcripts were coded, and some of the categories included the following:
- The role of feedback in formative assessment
- Teachers' view of summative assessment
- Constraints operating in the introduction of formative assessment
- Integration of formative and summative assessment

Thematic analysis showed that, on the whole, teachers preferred formative assessment because it allowed direct feedback and deeper learning. However, they admitted that the problem of time constraints and large class sizes sometimes obstructs them from using continuous formative assessment.

Ethical Considerations

Ethical clearance for the study was obtained from the Administrative Board of the school. An informed consent was obtained from all participants, including students and teachers, prior to the conduction of the study. The principle of voluntariness was observed; participants were guaranteed that personal information would not be disclosed and answers kept confidential. Data were kept in a secure environment and were accessed only by the research group.

Limitations

Although the study gives informative insight into both formative and summative assessments regarding student learning outcomes, there are a few limitations that have to be considered. The research was also conducted in one school and hence may not be generalizable to other settings. The

sample size adopted is adequate for most of the results to reach a level that might be considered statistically significant but not representative in all dynamics experienced in different learning settings. Lastly, the study was based only on self-reporting data from teachers and can therefore be biased.

RESULTS

Data analysis compares formative and summative assessments on the learning of students' outcomes in Mathematics, Science, English, and Social Studies. We measured the improvement in test scores after multiple formative and summative assessments. It is hypothesized that formative assessments-continuous feedback and adjustment-will provide greater opportunities to improve learning outcomes than summative assessments, where feedback for evaluation is usually given after instruction.

Statistical Overview

A total of 100 students across the four subject areas were evaluated. Each of the subject areas implemented both formative and summative assessments. A determination was made about the average gain in test scores for students in each type of assessment.

Table 2

Scores for students

Subject Area	Formative Improvement (%)	Summative Improvement (%)
Mathematics	15%	7%
Science	13%	5%
English	18%	8%
Social Studies	12%	6%

The table demonstrates that formative assessments realized higher test score improvements in all subject areas. The highest percentage of improvement was found in English at 18%, while summative assessment demonstrated generally lower improvements, with Mathematics showing the highest percentage increase of 7% in comparison to the rest of the subjects.

Key Findings

Improvement in Formative Assessments: Across the board, formative assessments tended to show more significant impacts on students' performances than summative assessments. It was indicated that with continuous feedback and iterative learning, the students learned the materials much more effectively and remembered when applying knowledge.

Summative Assessments' Impact: The impact of summative assessments on student learning was present but not as striking. That would again infer that summative assessments provide a measure of learning at the end of a unit but may not actively contribute to the learning process.

Subject-Wise Analysis

Mathematics: Students showed a gain of 15% in the test scores after formative testing, showing excellent gains in learning difficult concepts for students receiving regular feedback.

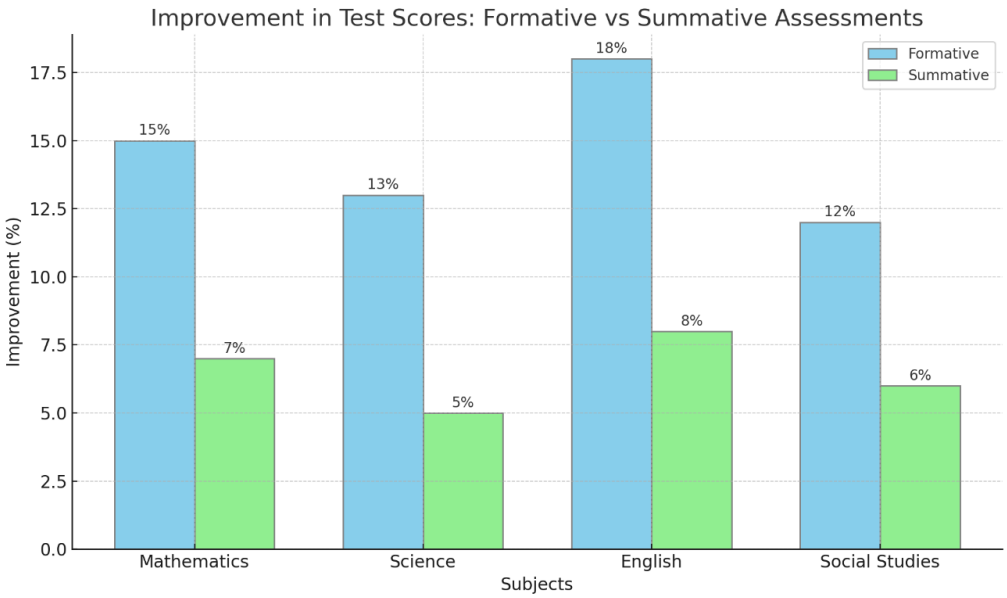
English: The impact of the formative assessments was highest in English, with an increase amounting to 18%. This could be explained by the nature of language learning, which is iterative in practice and feedback.

Science and Social Studies: This also saw significant increases at 13% and 12%, respectively, but lower than the subjects Mathematics and English.

The following bar chart displays the comparative improvements for formative and summative assessments across different subjects.

Graphic 2

Improvement in Test Scores: Formative vs. Summative Assessments



The above bar graph shows the comparative test score gains for formative versus summative assessments in each of the four subjects. As can be seen:

English showed the greatest increase from formative assessments, at 18%.

Mathematics followed at 15% improvement through formative assessments and 7% through summative assessments.

Science showed a 13% increase in improvement with formative assessments and through summative assessments showed a 5% increase.

Social Studies showed a 12% improvement with formative assessments and a 6% improvement with summative assessments.

While summative assessments showed improvement for students in all subject areas, it was overall less than that of formative assessment. The largest increase found for summative assessments was in Social Studies at 6%, while Mathematics was only 7% behind this. However, such achievement was consistently lower when compared to gains achieved through formative assessment, hence the little role summative assessments play in ensuring continuous learning and deeper understanding.

DISCUSSION

The data on the effects of formative assessments on learning outcomes show several meaningful findings about how different approaches to assessment shape students' academic performances. In the extended discussion section, we shall discuss why observed improvement differences between formative and summative assessments have emerged and what implication these might have for the practice of education.

Formative Assessments and Active Learning

Formative assessments create a dynamic interaction between the student and the material to be learned, promoting active learning. Active learning strategies-frequent quizzes, peer feedback, teacher-led reflections-make sure students do not just memorize content for a test but rather engage in deep ways with the subject matter of the class. This deep and consistent engagement aids in solidifying

knowledge and retaining it more so, as seen by the improvement rates across subjects in this study.

The highest percentage increase in our analysis belonged to English, 18%, because the learning of formative assessments iteratively supported one another. Continuous practice, immediate feedback, and gradual mastery of vocabulary and grammar are the identifying features of language acquisition. Students were able to hone their language skills in an ongoing manner thanks to the feedback provided through formative assessments. This may be related to claims previously made in the literature that point out the crucial nature of feedback loops in language learning (Black & Wiliam, 1998).

Mathematics and Science: Impact of Formative Assessments

Mathematics and Science, those subjects that are usually perceived as more objective and structured, also showed some quite remarkable improvement in formative assessment-15% and 13%, respectively. These subjects generally contain problem-solving and critical thinking that is very engaging. Formative assessment allowed students to engage in the application of formulae and solving problems with particular feedback given on the processes rather than the final answers. This is consistent with studies that have shown that formative assessments tend to be especially effective in building conceptual knowledge in mathematics and science (Hattie & Timperley, 2007).

Also, in STEM subjects, (Science, Technology, Engineering, and Mathematics), formative assessment effectively diagnoses misconceptions of students early, so that teachers may readjust instruction to make certain that students build on a solid footing, avoiding the accumulation of knowledge gaps that would negatively impact understanding later on.

The Role of Summative Assessments

While summative assessments are usually taken as the standard to measure the knowledge of students by the end of a certain instructional period, it seems that they have very minimal impact compared to formative assessments. For example, it was recorded that by summative assessments, improvements were registered at lower rates, such as 7% in Mathematics and 6% in Social Studies.

Summative assessments represent student achievement at any given moment and, while useful for grading and certification, may or may not themselves contribute to learning. Without feedback to guide students during the learning process, the ability to self-correct or further elaborate the learning is diminished, which may explain the relatively lower improvement rates associated with summative assessments in this study.

Comparative Impact on Different Subjects

Another set of interesting insights into the functioning of formative and summative assessments differently across disciplines yields subject-specific results:

English indicated the highest gains due to formative assessment because language acquisition requires the feedback constantly. The summative assessments could not achieve immediate correction needed to refine language skills that over time would have improved through practice.

Mathematics was supported through an iterative problem-solving approach inherent in formative assessments. By working on increasingly complex problems and receiving feedback about methods and strategies, students were better prepared for final summative assessments. The summative assessment improvement rate for mathematics was relatively high, at 7%, reflecting that some of the skills built through formative assessments carried over into the final evaluations.

Social Studies reflected a moderate effect size of formative assessment. Social studies require building up such critical thinking skills with conceptual understanding through interpretation and analysis of certain historical or social phenomena. Formative assessments in these fields most likely allowed iterative improvement in comprehension for complex concepts, though at a lower improvement of 12% level. This is reflected in the low improvement rate of 6%, probably because most

summative assessments in Social Studies place an emphasis on rote memorization of dates and facts, hence not as effective for deeper learning.

Science is practical-most of its laboratory-based-formative assessments comprised 13% and generally call for the continuous involvement of students in feedback. The possibility of adjusting hypotheses and methods in accordance with formative feedback would yield an unexpected but consistent improvement of student results. Summative assessments of science were 5% and thus seemed to yield the least impact; such assessments focus more on the testing of final knowledge rather than guiding students through the process of scientific inquiry.

Theories Supporting Formative Assessment Effectiveness

Various educational theories underpin these findings that formative assessments are more effective at promoting learning outcomes than summative assessments. Of these, one may refer to (Vygotsky, 1978) Zone of Proximal Development or ZPD-the theory that students learn best when they are operating just beyond their present capabilities with the guidance of a more knowledgeable other, teacher, or peer. And that is precisely what formative assessment does: provides this guidance through ongoing feedback, enabling students to take a step further toward knowledge and skills.

Other influential theories are Constructivism, which points to a central role of learners in constructing their understanding. Also, formative assessments agree with this theory since they enhance students reflecting on their learning, identifying the gaps, and taking responsibility for their improvement processes. In contrast, summative assessments cannot promote that kind of activity because they are more passive.

Furthermore, the Feedback Theory by (Hattie & Timperley, The Power of Feedback, 2007)supports the view that feedback is most effective in directing students as to where they are, where they should go, and how to get there. This "feed-forward" mechanism is instituted through formative assessments, which direct the students toward improvement before being formally tested.

Practical Implications for Educational Practice

Based on the key results highlighted in this study, several other important implications of practical application for educators and policy makers are as follows:

Increased Use of Formative Assessments: With apparent advantages presented by formative assessments, schools and teachers should be advocated to integrate more tools of formative assessment into their practice. This could be in the form of frequent quizzes, peer reviews, and interactive activities that provide ample opportunities for continuous feedback.

Balanced Assessment Strategies: While formative assessment may be critical to learning, summative assessment does have a role in evaluating achievement of outcomes. A balanced strategy incorporates elements of both types of assessments in the most optimal way to foster both learning and accountability.

Professional Development for Teachers: More specifically, it may be that teachers need additional professional development on effective strategies of formative assessment; especially how to give useful feedback to guide student improvement. Professional development programs on assessment for learning could assist teachers to implement these strategies with more effectiveness.

Tailored Assessment Approaches by Subject: Once again, as demonstrated by the differential impact of the study across the learning areas, assessments should be tailored to address specific learning needs in a particular subject area; for instance, the language areas may be better served by continuous formative feedback, while in mathematics and science, there needs to be a combination of both formative and summative assessments to determine processes as well as concepts.

Limitations of the Study

Although the present study gives useful insights into the comparative effectiveness of formative and summative assessments, a number of limitations have to be pointed out. First of all, the relatively limited sample size of 100 students narrowed the number of participants; hence, studies with larger samples in heterogeneous educational settings could confirm findings. Besides, this research was also focused on the gains according to test scores in the short run. Longitudinal studies tracking students over a more extended period may be able to provide more and further details about the long-term outcomes of either a formative or summative assessment.

CONCLUSION

This is a study showing the clear benefits of formative assessment over summative assessment in promoting deeper student learning and better outcomes across many subjects. From the comparison analysis, it can be said that formative assessment bears great importance in the continuum of engagement, self-regulation, and higher levels of understanding and thus ensures substantial improvements in student performance. In subjects like English, formative assessments allowed students to get timely feedback, rectify mistakes, and improve at an incremental rate of 18%. It is followed closely by Mathematics with a 15% increment. Even for traditionally hard subjects, such as Science with 13% and Social Studies with 12%, the positive influence of formative feedback is not invisible.

The nature of the formative assessment fits with the corresponding theories of learning, such as Constructivism, which describes learning as an active process by students in which knowledge is constructed through experience. The continuous feedback loops make it easier for learners to actively build on the material, draw relationships among ideas and develop critical thinking. Vygotsky's ZPD theory also indicates the important role of scaffolded support by teachers; in formative assessments, this allows students to reach much higher levels of knowledge than they will be able to achieve independently.

Summative assessments, on the other hand, have a much stronger focus on endpoint assessments of knowledge and skills, and in these cases, far lower levels of student improvement. Whereas in Mathematics, the highest improvement through summative methods was standing at 7%, the increases in English and Social Studies were less. Whereas summative assessments do provide necessary benchmarks against which overall learning achievement is gauged, as much as anything else, they cannot bring forth the immediate benefits of formative ones in bridging gaps in learning or furthering continuous intellectual development.

Both formative and summative assessment methods provide a balanced approach to assessment, which is important in effective and comprehensive educational strategy. Summative assessments are indeed useful for measuring cumulative knowledge but should not dominate the process of evaluation. Rather, formative assessments must be integrated as a continuous tool that fosters reflective learning and adaptive instruction. This integrated approach allows educators to track progress and build accumulation of understanding over time by showing student learning trajectories, which point out places where students may need further support.

There are a number of implications because of these findings in regard to education policy and classroom practice. First, educators need to receive the training they will need to effectively use formative assessment strategies. Professional development will help teachers improve their methodology of feedback and make the students' learning environment more interactive. Of all assessment frameworks, schools should emphasize formative assessment so that learning is a continuous process meant to keep students at ease rather than studying for and appearing for the final exams.

This study gives further support to carrying out an investigation on how formative assessments can

be adapted across different age groups and learning contexts. In this regard, conclusive studies are targeted toward demonstrating the sustainability of these formative assessment practices for a longer period in terms of specific student outcomes, such as developing problem-solving, critical thinking, and independent learning skills.

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