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Relationship of Formative Assessment with Academic Performance of Students at Elementary Level

Article Details

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ABSTRACT

Formative assessments are teaching strategies used to measure student understanding and make in class adjustments to improve a lesson. Formative assessment can also improve student achievement. It also aims at exploring the relationship of teachers' current understandings of formative assessment students' achievement. In order to achieve the aforementioned objectives, a descriptive correlational research design was employed. Formative assessment is an approach for evaluating student progress and achievement that has become a widely used practice in elementary classrooms. This research findings showed empirical evidence that formative assessment has positive and average relationship with academic performance at elementary level students. Formative assessment has become a relevant topic for researchers and the greater educational community for its positive correlation with students' achievement.

INTRODUCTION

Assessment is an important component of effective teaching and learning (Hargreaves, 2008) and formative assessment strategy plays a crucial role in supporting the student learning. This assessment strategy provides effective feedback and instructional correctives in the teaching-learning process to improve students' learning, motivation, and self-regulation skills (McMillan & Cauley, 2010). Formative assessments also known as assessment for learning, diagnostic testing, and feedback are ongoing process used by teachers, students, and students' peers (Andersson& Palm, 2017). Teachers can adjust their teaching practices to increase student learning through formative assessment (Black & Wiliam, 2009).

Formative assessment is therefore administered more frequently than traditional forms of summative assessment, to ensure that teaching strategies are congruent with student needs. Evidence is gathered are less relevant in comparison to ensuring that results be "used as feedback by teachers and student to improve teaching and learning, respectively" (Shute & Kim, 2014).

Formative assessment has the succeeding three main stages; namely, (1) determining goals, (2) providing feedback to enhance student performance with these goals, and (3) using feedback to improve further learning of students (Brookhart, 2010). One of the most important components of formative assessment is feedback that helps to provide evidence on student learning (Andersson& Palm, 2017). This feedback to advance student learning could come from different agents such as teachers, self-assessment, peer assessment, group assessment, and even computers (Wiliam, 2018). Thus, different types of feedback provide different formative assessment interventions (Hattie & Timperley, 2007). Feedback from teachers and students has an important role in formative assessment practices due to their significant support for student teaching (Black & William, 2009), self-regulated learning (Andrade & Brookhart, 2016) Students' engagement in self-assessment and peer-assessment for effective formative assessment strategies promotes their self-regulated learning skills (Weldmeskel & Michael, 2016). In addition to teacher and student initiated formative assessment, computer initiated formative assessment also provides immediate feedback to students (Van der Kleij et al., 2015). These studies showed that computer-based feedback has an important effect on student teaching (Miller, 2009). However, in comparison to formative feedback from teachers and students, computer-based formative assessment is more difficult to apply (Maier et al., 2016).

The characteristics of effective formative assessment include four main components: role of

assessment, frequency of assessment, format of assessment and feedback (Shute, 2008). The role of assessment for learning prioritizes the process used by educators to optimize student learning while enhancing instructional methods (McKeachie & Svinicki, 2013). Unfortunately, adjusting instructional strategies in response to student feedback is one of the least utilized components of formative assessment by educators, as well as being the least emphasized during professional development (Shute & Kim, 2014). The most important component of formative assessment is feedback, from student to student, instructor to student and student to instructor (Hattie &Timperley, 2007). Feedback should be provided as a helpful constructive guide to advance student learning and instructional practices without the pretense of being "judgmental" (Shute, 2008). A task that can be difficult given the lack of context and tone that can frequently accompany online correspondence.

Formative assessment or assessment for learning is a method of evaluation that has gained considerable attention from educational stakeholders for its capacity to positively impact student learning (Baas, Casteljins, Vermeulen, Martens, & Segers, 2015) where students actively engage in learning activities. Teachers are responsible for providing their students with feedback that can give certain learning Clues and point students in the right direction of their learning goals. The use of feedback during the learning process can help a student recognize gaps in his or her learning and give him or her knowledge to fill those gaps. Learning tasks become more defined for the learner, as he or she is self-motivated rather than motivated by an external factor. For example, students may fear losing points on an assignment or fear of repercussions from the teacher.

In this study, Formative Assessment was implemented to measure the effect it had on student motivation and self-regulated Learning strategies. There are several methods to define student performance, but the most typical is an increased numerical score on either a teacher-generated summative exam or a state-mandated standardized assessment.

In a review of the literature Black & Wiliam (2010) looked at the ability of formative assessments to improve achievement of students. They looked at studies where students that received an "innovation" (formative assessment) had significantly increased achievement than similar students without the innovation. They noted that low performing students saw an even greater improvement in achievement than already high achieving students.

In a study by Hudesman, Crosby, Flugman, Issac, Everson, and Clay (2013) it was found that a comprehensive formative assessment and self-regulatory learning lead to

significant achievement improvement pass rates of associate level mathematics course. In the study they used a prescribed treatment of specific feedback, quizzes where students received specific feedback about their progress on specific assessment questions and students take surveys about their awareness. The focus of this student is to use the feedback portion of formative assessment and having students thinking about their learning. This showed a significant improvement in achievement for those students.

In a study by Carrillo-de-la-Peäna, Baillåes, Caseras, Martâinez, Ortet&Pâerez (2009) found that formative assessments showed a significant improvement in undergraduate students majoring in health sciences. The students received immediate and deliberate feedback on quizzes during their term. The students that received the immediate feedback performed better on subsequent quizzes and on the summative assessments at the end of the term.

All of these studies are directly related to one another. Each study demonstrates that there is a strong connection between success and formative evaluation. There are no specifications on how formative assessments will be fully implemented to take other things into account except the formative assessment itself. This study seeks to identify a -specific formative assessment strategy and to see if there is significant evidence that this strategy helps improve student performance. One of the main problems identified by is the poor assessment methods used by many teachers in elementary schools. This study examined the effect of formative assessment on student academic performance. There is a possibility that students would go forward with the course or unit without knowing key elements of the learning outcomes. The unit might not accomplish what is intended, and valuable learning time will be lost.

OBJECTIVES

1) To find out the relationship of formative assessment on academic performance
2) To find out the relationship of formative assessment on student's academic performance with respect to demographic variables

LITERATURE REVIEW

Formative assessment is used to achieve the goal of assessing a students' learning and tailoring instruction based on the needs of the student so that the instruction can better suit the student's needs. Formative assessment can be used by teachers to gauge student learning while it happens and helps teachers respond to the needs of the students (Cotton, 2017). Assessment can be used to send a message to students and that message is what counts as knowledge in a learning environment (Hollingsworth, 2012). If formative assessment is used as a message for

students to be able to prepare for the summative assessment, then overall student learning should improve as a result.

Formative assessment is an important practice and can be utilized in every teacher's Classroom. Formative assessment is important to the teacher because it can help a teacher recognize students' needs, track student achievement, and offer opportunities to succeed (Rasmussen, 2017). Formative assessment can help make the learning more individualized, as there are no two learners that are completely similar (Greenstein, 2010). Additionally, formative assessment can be beneficial to the student, as stated by Moss and Brookhart (2009): students understand and use learning targets, set their own learning goals, select effective learning strategies, and assess their own learning progress. And as students develop into more confident and competent learners, they become motivated (energized) to learn, increasingly able to persist during demanding tasks and to regulate their own effort and actions when they tackle new learning challenges.

If formative assessment can provide what is missing for both students and teachers, then there is no reason it should not be used. Other than the extra time it takes for teachers to understand and implement formative assessment, there seems to be no apparent drawback. With respect to formative assessment use, the available literature shows several uses on "identifying the gap between what students have learned" (Taras, 2009), and what they should learn, increasing student motivation, learning improvement, and adjustment on instruction. Formative assessment provides feedback on an ongoing instruction and focuses on how the students are changing in the learning process. Formative assessment is less formal and helps the educator to improve instruction by guiding students. Although educators collect the results of formative assessment, they seldom use the information to report official grades or achievement standards (Nitko, 2004) Researchers in the field of educational assessment define formative assessment in many different ways. Most of the definitions indicate the existing conceptualizations on learning and assessment. For example, Shepard (2005b) argues, "the official definition of formative assessment to be the one that best fits the research base from which one derives its claims of effectiveness." Correspondingly, as Shepard points out, there is a general agreement in that "What makes formative assessment, formative is its immediate use to make adjustments to form new learning . An assessment carried out to improve instructional effectiveness and student learning is formative assessment (Shepard, 2005b). Looney (2011) defines formative assessment as "a frequent and interactive assessment of student progress and

understanding to identify learning needs and adjust instruction appropriately." Formative assessment is nothing more than the process a classroom teacher would use to monitor how well his/her students are grasping a particular lesson or standard and the feedback needed to adjust the lesson plan, so that all students can master the concept (s) being taught (Labay, 2011). Formative assessment is an assessment activity that supports learning through the provision of feedback information as a consequence of which the educator and the students improve instruction and learning activities (Black, et al., 2004). Here, the evidence obtained through assessment activities help to address the students' needs by improving instruction.

Popham (2006) also holds a similar view. For him, an assessment is formative to the extent it assists in the adjustment of instruction with the aim of meeting the learning needs of the students assessed. Kahl (2005) and Trumbell and Lash (2013) describe formative assessment as the tool the educator use to identify the specific misconceptions and mistakes made by the students while the instruction is ongoing. Assessment is a purposeful activity in which the evidence benefits the educators and the students to adjust the ongoing learning and instruction (Dunn & Mulvenon, 2009). As William (2011) explains, the evidence obtained from formative assessment provides information on the appropriate techniques of instruction, which possibly lead to learning improvement. On the other side, Elwood and Klenowski (2002) and Clark (2011) conceptualized formative assessment by classifying it into two categories as "assessment for learning (AfL) and assessment as learning (AaL)." AfL centres the student and is used to examine the progress towards a desired goal, seeking to narrow the gap between the student's level of learning and the desired learning outcomes. It involves activities such as discussing on the expected learning objectives, performance criteria, questioning and feedback which help in the attainment of the desired learning objectives. In contrast, assessment as learning supports autonomous learning and self-assessment as well as peer participation in learning and assessment. In assessment as learning, students have the opportunity to plan and share each other's learning targets and criteria for success (Clark, 2011). According to Clark, educators may design assessment for learning and assessment as learning "to encourage a real-time feedback loop between teacher and student and among peers." Hence, Clark (2011), states that educators can design assessment for learning in such a way that the students are able to understand clearly what they are trying to learn and what is expected of them, given immediate feedback about the quality of their work and what they do to make it better, given advice about how to sustain improvement, fully involved in deciding what needs to do next, and aware of

who can give help if they need it and have full access to such help. Furthermore, Clark (2011) formulated the two key principles underlying assessment as learning.

These principles state as follows: the students should be able to build knowledge of themselves as students and become meta-cognition, and take more responsibility for their learning and participate more in the process of learning with their teacher as their advisor and with their peers in a climate of equality and mutuality.

RESEARCH METHODOLOGY

A descriptive research design was adopted for this study. "Descriptive research involves the identification of attributes of a particular phenomenon based on an observational basis or the exploration of correlation between two or more phenomena," (Creswell, 2002). This is quantitative description technique that seeks to answer questions about real life situations. A descriptive research design can use a wide variety of research methods to investigate one or more variables. A cross-sectional survey was used to collect data for this research. It is defined as a study in which researcher gathered data about a particular population at one fixed point in time. Researchers have taken the teacher's population from District Bagh at elementary level. Total numbers of teachers in district Bagh are 1012. A sample is specific group that you will collect data from. A sample of 276 elementary teachers was selected using random sampling techniques for this research study. The questionnaire was used for teachers which contain 20 statements with demographics. The reliability of questionnaires was calculated by using SPSS, Cronbach's Alpha value was found 0.725 which was highly significant for the conduct of the study. The sampled participants were given the surveys. The researchers personally visited the sampled departments and distributed the questionnaires among respondents with clear instructions to fill it out. Time of one week was given to them to give their responses. On the fixed day, the researchers visited the department again and collected all the distributed questionnaires.

DATA ANALYSIS

Data was analyzed with the help of SPSS and person correlation coefficient was calculated.

TABLE 1: CORRELATION OF FORMATIVE ASSESSMENT WITH ACADEMIC PERFORMANCE

Correlation		Academic Performance
Formative Assessment	Pearson Correlation	.205**

	Sig. (2-tailed)	.001
	N	276

**. Correlation is significant at the 0.01 level (2-tailed).

Table 1 presents the correlation between formative assessment and academic performance, based on a sample of 276 participants. The key statistics included are the Pearson correlation coefficient and the significance level. The Pearson correlation coefficient of 0.205 indicates a positive correlation between formative assessment and academic performance. This suggests that as the effectiveness of formative assessments increases, academic performance tends to improve as well. Although the correlation is positive, a coefficient of 0.205 implies a moderate relationship, meaning that while there is a tendency for higher formative assessment scores to be associated with better academic performance, the strength of this relationship is not particularly strong. The significance value (p-value) of 0.001 indicates that the correlation is statistically significant at the 0.01 level (2-tailed). This means that there is a very low probability (0.1%) that this correlation occurred by chance. Therefore, we can confidently assert that there is a significant relationship between formative assessment and academic performance within this sample.

In summary, the data in Table 1 indicates a statistically significant positive correlation between formative assessment and academic performance, with a Pearson correlation coefficient of 0.205. While the correlation is significant, its weak to moderate strength suggests that while formative assessments do contribute to academic performance, other factors likely play a substantial role as well.

TABLE 2: RELATIONSHIP OF FORMATIVE ASSESSMENT WITH ACADEMIC PERFORMANCE GENDER WISE

Gender wise Correlation			**Academic Performance**
Male	Formative Assessment	Pearson Correlation	.329**
		Sig. (2-tailed)	.000
		N	130
Female	Formative Assessment	Pearson Correlation	.100
		Sig. (2-tailed)	.230
		N	146

**. Correlation is significant at the 0.01 level (2-tailed).

Table 2 provides a gender-wise correlation analysis of formative assessment with academic performance, distinguishing between male and female participants. The Pearson correlation coefficient for males is 0.329, indicating a moderate positive correlation between formative assessment and academic performance. This suggests that higher scores in formative assessments are associated with better academic performance among male students. The significance value (p-value) for males is 0.000, meaning the correlation is statistically significant at the 0.01 level (2-tailed). The Pearson correlation coefficient for females is 0.100, which indicates a weak positive correlation between formative assessment and academic performance. This suggests that while there is some relationship, it is much weaker compared to the male group. The significance value for females is 0.230, which is above the 0.05 threshold for statistical significance. This implies that the correlation is not statistically significant; suggesting that any observed relationship between formative assessment and academic performance for females may be coincidental.

In summary, Table 2 reveals that, for male participants, there is a statistically significant moderate positive correlation ($r = 0.329$, $p < 0.01$) between formative assessment and academic performance. In contrast, for female participants, the correlation ($r = 0.100$, $p = 0.230$) is weak and not statistically significant. This highlights a gender difference in how formative assessments relate to academic outcomes, with males showing a stronger and significant relationship compared to females.

TABLE 3: CORRELATION OF FORMATIVE ASSESSMENT WITH ACADEMIC PERFORMANCE LOCATION WISE

School Location			Academic Performance
Urban	Formative Assessment	Pearson Correlation	.142
		Sig. (2-tailed)	.430
		N	33
Rural	Formative Assessment	Pearson Correlation	.230**
		Sig. (2-tailed)	.000
		N	243

**. Correlation is significant at the 0.01 level (2-tailed).

Table 3 presents the correlation of formative assessment with academic performance, segmented by school location, comparing urban and rural students. The Pearson correlation coefficient for urban students is 0.142. This indicates a weak positive correlation between

formative assessment and academic performance. While there is a slight tendency for higher formative assessment scores to relate to better academic performance, the strength of this relationship is minimal. The significance value (p-value) for urban students is 0.430, which is above the commonly used threshold of 0.05 for statistical significance. This suggests that the observed correlation is not statistically significant, implying that any association between formative assessment and academic performance in this group may be due to random chance.

The Pearson correlation coefficient for rural students is 0.230, indicating a moderate positive correlation between formative assessment and academic performance. This suggests that higher scores in formative assessments are more reliably associated with better academic performance among rural students. The significance value for rural students is 0.000, indicating that the correlation is statistically significant at the 0.01 level (2-tailed). This strong significance means it is very unlikely that the observed relationship occurred by chance, supporting the reliability of the correlation. In summary, Table 3 highlights distinct differences in the correlation between formative assessment and academic performance based on school location. For urban students, the correlation is weak ($r = 0.142$) and not statistically significant ($p = 0.430$), suggesting a lack of meaningful relationship. Conversely, rural students exhibit a moderate statistically significant positive correlation ($r = 0.230$, $p < 0.01$), indicating a more substantial relationship where effective formative assessments are associated with improved academic performance. This suggests that formative assessments may play a more critical role in enhancing academic outcomes in rural contexts compared to urban settings.

TABLE 4: CORRELATION OF FORMATIVE ASSESSMENT WITH ACADEMIC PERFORMANCE DESIGNATION WISE

Designation wise			**Academic Performance**
EST (General Teachers)	Formative Assessment	Pearson Correlation	.195**
		Sig. (2-tailed)	.005
		N	202
EST Science Teachers	Formative Assessment	Pearson Correlation	.288*
		Sig. (2-tailed)	.034
		N	54
EST (Qaria	Formative Assessment	Pearson Correlation	.086
		Sig. (2-tailed)	.718

Teachers)	N	20

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4 presents the correlation of formative assessment with academic performance, differentiated by teacher designation. The Pearson correlation coefficient for EST (General Teachers) is 0.195, indicating a weak to moderate positive correlation between formative assessment and academic performance. This suggests that as formative assessment scores increase, there is a tendency for academic performance to improve among general teachers. The significance value (p-value) for this group is 0.005, which is below the 0.01 threshold for statistical significance. This means the correlation is statistically significant, implying that the relationship is unlikely to have occurred by chance. The Pearson correlation coefficient for EST Science Teachers is 0.288, indicating a moderate positive correlation between formative assessment and academic performance. This suggests a stronger relationship than that observed in general teachers, where better formative assessment scores are associated with improved academic outcomes. The significance value for this group is 0.034, which is below the 0.05 threshold for statistical significance. This indicates that the correlation is statistically significant, reinforcing the reliability of the association between formative assessments and academic performance among science teachers. The Pearson correlation coefficient for EST (Qaria Teachers) is 0.086, indicating a very weak positive correlation between formative assessment and academic performance. This suggests that there is little to no relationship between formative assessment scores and academic performance in this group. The significance value for this group is 0.718, which is well above the 0.05 threshold. This indicates that the correlation is not statistically significant; suggesting that any observed relationship is likely due to chance. In summary, Table 4 reveals differing correlations between formative assessment and academic performance across teacher designations. General teachers show a statistically significant weak to moderate correlation ($r = 0.195$, $p = 0.005$), while science teachers demonstrate a stronger moderate correlation ($r = 0.288$, $p = 0.034$), both indicating meaningful relationships. Conversely, Qaria Teachers exhibit a very weak correlation ($r = 0.086$) that is not statistically significant ($p = 0.718$), suggesting the lack of a reliable relationship in this group. These findings indicate that the effectiveness of formative assessment may vary significantly depending on the teacher's area of expertise.

CONCLUSION & RECOMMENDATION

In conclusion, overall and demographically the formative assessment has a significant positive relationship with elementary students' academic performance in district Bagh. Through ongoing feedback, monitoring, and adjustments, formative assessment practices empower teachers to identify students' strengths and weaknesses, enabling targeted instruction. This personalized approach fosters a deeper understanding of concepts, encourages active student engagement, and promotes self-reflection and met cognition. As a result, students in District Bagh experience enhanced learning outcomes, improved retention, and increased motivation to succeed. By implementing formative assessment strategies, educators can effectively support students' academic growth and create conducive learning environment that nurtures their potential, paving the way for future success. Formative assessment involves continuous monitoring and feedback to enhance learning outcomes. By implementing this approach, teachers can identify students' strengths and weaknesses, allowing them to tailor instruction accordingly. Ultimately, integrating formative assessment strategies in elementary education in District Bagh positively influences students' academic achievement and overall development.

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