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Classroom Assessment Data Use Practices Among Basic School Teachers in Ghana

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Abstract

Assessment results can be a guide to instruction, and they can ensure that the prescribed curriculum is well covered. When assessment data are used as a means of making appropriate instructional adjustments for improvement, teaching and learning progresses. The study examined basic school teachers' perception and use of assessment data. Cross-sectional survey design was used for the conduct of the study. Hundred and fifty (150) teachers within the Central region of Ghana were sampled from twenty (20) basic schools using systematic sampling procedure. A two-dimensional questionnaire was adapted, validated and used for the collection of research data. The data to provide answers to the study question were analysed using descriptive statistics, specifically, percentages and frequencies. The hypothesis was tested using Partial Least Square structural equation modelling approach. Findings revealed that in practice, basic school teachers use assessment data to plan instruction, evaluate students' learning progress, determine curriculum strands to emphasize during teaching sessions and also to evaluate instructional effectiveness for the academic year. The study further showed that teacher perception about assessment significantly predict assessment data use. The study recommends that, tertiary institutions that train teachers must continue to place much emphasis on the teaching of 'assessment in schools' to deepen prospective teachers' knowledge and utilization of assessment data for sustenance of positive 'assessment data use practices' in Ghana basic schools.

Keywords: curriculum, assessment data, formative, summative, instrumental attitude

1. Introduction

Globally, the common challenge that teachers face is to create a learning environment in their classroom in which students can develop conceptual understanding and skills (Anderson, 2017). To create such an academic atmosphere, it is essential that teachers get a good view of their students' current stage of development and learning (Remesal, 2011). Without this knowledge, teachers' teaching might be out of sync with their students' learning progress. To gather this relevant information, teachers must assess their students regularly. This assessment by teachers is often called classroom assessment (Shepard, 2000). While data can be used to inform decisions at every level in an education system, research has consistently demonstrated the value of using assessment data in classrooms to enhance teacher instruction and, ultimately, improve student achievement (Hattie, 2009; McNaughton, Lai, & Hsiao, 2012). Assessment data constitute any information related to student achievement that emanate from a wide range of assessments procedures, such as written and oral exams, standardized tests, portfolios, and report cards (Schildkamp & Lai, 2013). Such data can provide essential information on students' progress toward different curricular aims or standards which can then be used by teachers to inform their instructional practices (also known *as* formative assessment).

Even though a lot of assessment procedures such as oral test, teacher made test, observation and so on are noted to provide somewhat information, standardized tests could allow for both criterion- and norm-referenced interpretations of performance (Murchan & Shiel, 2017). Therefore, it is reasonable to argue that assessment data from standardized tests can provide useful information to teachers to inform their teaching practices. Standardized tests theoretically provide a consistent, objective means of evaluating a broad range of students on the same set of academic standards, measured in the same way (Warring, 2015). Despite its potential to support instruction, it appears that basic school teachers' use of assessment data can vary significantly (Farrell & Marsh, 2016; Gelderblom, Schildkamp, Pieters, & Ehren, 2016). A clearer view of the common ways by which basic school teachers use assessment data may help in several policy directions ranging from teacher training policies and professional development issues.

Assessment data are often used for two decisions, that is, formative and summative decisions (Scriven, 1967). Summative assessment is often used at the end of an instructional period, usually for purposes of certification and placement. For example, educators can use summative assessment when they have to compose an end-of-year report to decide whether students can move up to a next grade level. Formative assessment is meant to obtain information about students' learning process to make informed decisions on how to design the learning environment so that learning can be maximized (William, 2011). Another purpose of assessment is diagnostic assessment, this is a special form of formative assessment in which assessment is used to obtain detailed information about individual students' prior knowledge, ways of reasoning, use of strategies, and misconceptions (Crisp, 2012; Keeley & Tobey, 2011).

Studies suggest that the availability of assessment data can, indeed, help the process of improving teachers' instructional practices. For example, McNaughton et al. (2012) examined teachers use of assessment data driven intervention and its impacts on learners' achievement. The intervention was directed toward improving instruction using reading assessment data. Findings indicated that, the use of assessment data had a positive impact on instructional practices, which, in turn, improved students' reading outcome. Lachat and Smith (2005) conducted a qualitative study of teachers' use of data in five low-performing urban high schools that were undergoing reform in order to raise student achievement. Though the findings were limited, Lachat and Smith found implementing the use of data to positively affect student achievement. In a similar investigation, Petersen (2007) studied three different basic schools across Califonia, that made a definite effort to use assessment data to inform instruction. Findings showed that all the three schools reported that the use of the assessment data had a positive impact on students learning. Serving populations that would be considered challenging, teachers at each school found consulting data helped inform their instructional practice resulting in raised student test scores. Earlier, Yeh (2006) examined the use of a rapid assessment system for K-12 math and reading in one Texas school division. The rapid assessment data system was designed to provide teachers, administrators and students' feedback regarding student progress. The study results indicated that over 87% of the teachers who participated in the study reported that the rapid assessment data system's feedback made them more effective, allowing them to make immediate instructional adjustments.

The use of data by teachers to inform instructional practices and decisions appears to be complex. Teachers can respond to assessment data in different ways. While some teachers may, indeed, change their instructional practices in response to the data, others may not (Oláh et al., 2010). Kippers, Wolterinck, Schildkamp, Poortman, and Visscher (2018) found that although teachers in the Netherlands use various kinds of classroom assessments for information on student achievement, the systematic analysis of these data to support teaching has not been integrated into their practice. There is also some evidence to suggest that teachers engage in inappropriate test preparation practices in response to outcome data (e.g., teaching to the test) (Amoako, 2019; Jennings & Bearak, 2014). Further, based on their interviews, Gelderblom et al. (2016) concluded that although teachers claim to be aware of the importance of data use and consider themselves to use data to a great extent, their use of data for instructional purposes often go amiss. The inconsistency of study findings on teachers use of assessment data in the literature makes the subject of "teachers use of assessment data" critical and the fact that research should be ongoing on the subject in order for it to be understood by stakeholders of education.

Even though studies are replete on the enormous significance of assessment data use, there are several reasons for some teachers making use of assessment data and others not making use of it. Empirical studies outline characteristics of the educational institution, data and the user of the data (i.e. the teacher) as possible reasons. First of all, Schildkamp et al. (2017) in a review discovered that several organizational characteristics can influence the use of data in schools by teachers. These include the presence of a shared vision and a structured method for analysis and interpretation of data on which to base actions. Also, teachers are more likely to use data if these data have certain features such as accessibility and usability (Halverson, 2010). And lastly, the characteristics of teachers can also impact data use and engagement. Young, McNamara, Brown, and O'Hara (2018) assert that effective data use requires teachers to have the ability to collect, analyze, and use data strategically. This requires teachers to pose actionable questions, identify what data would answer these questions, understand what the data say and, then, apply it to planning instruction (Means, Chen, Debarger, & Padilla, 2011). A study by Timperley (2009) in the US supported this assertion as teachers who lacked sufficient pedagogical content knowledge were unable to make appropriate inferences from test score data to inform their instructional practices. Schildkamp and Poortman (2015) also discovered that appropriate data use required pedagogical content knowledge. Further, as shown by Kleickmann et al. (2013), novice teachers' content knowledge and pedagogical content knowledge developed over time, in the same direction, the use of data to inform one's teaching practices may be a function of a teacher's overall years spent in the teaching profession.

Aside the three characteristics discussed in the immediate preceding paragraph, another area of concern has to do with teachers' beliefs and attitudes in relation to the value of assessment data. Examining teachers' attitude allows for a greater understanding of their willingness to use data for a range of instructional purposes. Prenger and Schildkamp

(2018) explored the attitude of basic school teachers relating to the use of assessment data across 131 Dutch schools. The study discovered that the use of assessment data (arising from curriculum-based assessments and/or standardized assessments) for instructional purposes was heavily influenced by teachers' instrumental attitudes. Instrumental attitudes relate to teachers' "beliefs about the likely consequences or other attributes of data use". The study further discovered that teachers' attitudes had a significant and positive relationship with assessment data use, suggesting that teachers with a positive disposition toward the utility and value of certain types of data were more likely to use those data to inform their own instructional practices. Copp (2016) investigated teacher perception and use of assessment data for instructional purposes. After taken survey responses from 1963 Canadian teachers, results showed that teachers had good conception about assessment data and indicated that, they use often to alter classroom instruction. In a different opinion, Remesal (2011) argued that teachers' beliefs were often of 'mixed conception' and that, despite research that indicates the importance of beliefs, LSA policies tended to zero in on 'assessment competence' or 'assessment literacy' rather than addressing attitudes.

Given the impact that assessment data use by teachers may have on teacher instruction and, ultimately, student achievement, it is essential that a better understanding of what factors may be associated with this use of assessment data is realized. In Ghana, the practice of school based assessment (SBA) envelopes a lot of test forms such as class exercises, quizzes, homework, and projects throughout the entire nine-year basic schooling. Aside the internal school based assessment scores, there is also a final external assessment that adds up to a students' SBA scores to contribute to the final grading of the students for the purpose of certification as stipulated in the nation's assessment policy framework (Amedahe, 2001). The West African Examinations Council (WAEC), the main examining agency in the West African sub-region, conducts the external examination component on behalf of the Ministry of Education (MOE). Because the teacher-assessment scores from different schools across the country are not comparable, the WAEC moderates the teacher-assessment scores using the external examination scores before combining them with the external scores for grading candidates. The moderation is a linear transformation procedure by which students' teacher-assessment scores in a subject are adjusted so that their distribution has the same mean and standard deviation as the distribution of scores on the external examination for that school (Amedahe, 2001).

Scores that are generated from both internal and internal assessment procedures provide data for discussions around teachers' instructional effectiveness and students' performance. Studies in the assessment literature are replete with assessment data use practices of elementary teachers but for more advanced jurisdictions such as United States of America, Netherlands, China, just to mention a few (Kippers et al. 2018; Young et al. 2018; Oláh et al., 2010). The dynamics of assessment data usage in the Ghanaian context, especially, for taking instructional management decisions remains unknown and an area that less attention has been ascribed. Even more critical is the attitude that basic school teachers in Ghana have in relation to the use of assessment data for purposes of improving instruction. The absence of the foregoing information creates a knowledge gap within the assessment literature and also with a rippling consequence of denying stakeholders of education the true picture of how teachers in Ghana basic schools have dealt with assessment data. Even though scholars in Ghana have been concern with assessment issues, the focus has been on general classroom assessment practices (Anhwere, 2009) where basic school teachers have been found to possess limited skills in the construction and administration of test items (Quansah, Amoako & Ankomah 2019; Amedahe, 1989), have negative attitude toward the construction of test items where they predominantly depend on past questions (Etsey, 2003; Quansah & Amoako, 2018), and the fact that teachers go through a lot of challenges when developing tests for classroom assessment (Buabeng, Atingane & Amoako, 2019). Once again, what appears to be missing relate to teachers' beliefs and attitude for assessment data and how they make use of assessment data. This current study, therefore sought to investigate teachers' perception or belief about assessment and how they make use of same to improve instruction. To achieve the foregoing aim, objectives that guided the study included:

(a) Examine how basic school teachers' make use of assessment data.

(b) Investigate the effect teachers' perception of assessment (belief) on their assessment data use.

Research Question

1. *How do basic school teachers make use of assessment data?*

Research Hypothesis

H_0: Teacher perception about assessment will not significantly affect assessment data use.

H_1: Teacher perception about assessment will not significantly affect assessment data use.

2. Method

Design

The thrust of the study was to investigate teacher perception and use of assessment data. In order to examine the current practices in line with the phenomenon under investigation, the study employed cross-sectional survey design. This design was ideal because of its potency to investigate psychological variables and report issues as they unfold within a natural context (Leedy & Ormrod, 2005).

Participants

Among the thirteen (13) districts within Central Region of Ghana, Cape Coast metropolis and Komenda Edina Eguafo-Aberim (KEEA) municipality were selected as the target zones for the study. The reason for the selection of these two areas were premised on geographical advantage for research data collection since many public schools are clustered within these two areas. Basic school teachers were the target group for the conduct of the study. Ten (10) schools were selected from Cape Coast metro and KEEA using systematic sampling approach. In all twenty schools (20) were selected. Hundred and fifty (150) teachers were also conveniently selected and engaged as the study participants. Teachers from upper primary (i.e. grade 4 to 6) and Junior High Schools (i.e. grade 7 to 9) were used. The study was founded on the assumption that data from the national examination [i.e., Basic Education Certificate Examination, (B.E.C.E).] were more relevant to the upper grade and the JHS levels for instructional management decisions.

Measures

A multi-dimensional questionnaire was adapted from Pitsia, Karakolidis and Lehane (2021) for the purpose of measuring teachers' perception and assessment data use practices. The first dimension of the instrument was on teacher perception about assessment. This sub-dimension had 15 items and a Cronbach alpha reliability index of .93. The second dimension also measured how teachers' use assessment data. The sub-dimension had 10 items and Cronbach alpha index of .92. The questionnaire was a four-point Likert kind of scale with predominantly positive worded items. The instrument was pilot tested to fine-tune the items for more dependable measurement of the constructs under investigation.

Data Collection and Analysis Procedure

Formal permission was sought from authorities of the selected schools within the metropolis and the municipality. To fulfil the ethical demands of the study, participants were made to sign consent form to endorse their willingness to be part of the study. After exhausting all ethical protocols, the researcher used eight weeks to take data from the participants in their school premises. Data was managed professionally and entered into appropriate software for analysis. In the analysis of the data, research objective one was analysed with descriptive statistics, specifically, bar graph. However, research objective two was analysed using variance based Structural Equation Modeling (SEM), specifically, Partial Least Square (PLS) model.

3. Results

Research question

How do basic school teachers make use of assessment data?

This research question sought to explore the current practices of basic school teachers utilize assessment data. Assessment data is in reference to the nationwide examination data provided by West African Examination Council (WAEC) to basic schools in Ghana.

Data to answer the research question were analysed using percentages and frequency count. Table 1 provides summary of participants' responses.

Table 1. Teachers' assessment data use

Statements	Agree	Disagree
To know the standard to use to identify individual student's strengths and weaknesses.	31(21%)	119(79%)
Group students within class.	12(8%)	138(92%)
Inform other teachers about student performance/progress within the past academic year.	50(33%)	100(67%)
Inform planning of instruction, that is, methods and teaching and learning materials to use.	150(100%)	--
Evaluate student progress for the academic year.	150(100%)	--
Determine curriculum strands to emphasize.	120(80%)	30(20%)
Evaluate teaching effectiveness for the past academic year.	150(100)	--
Discuss with parents about student performance/progress.	13(9%)	137(91%)
Discuss with students about their performance/progress.	16(11%)	134(89%)
Drill students more on past questions on strands that are mostly emphasized by WAEC.	98(65%)	52(35%)

Source: Field Data, 2021

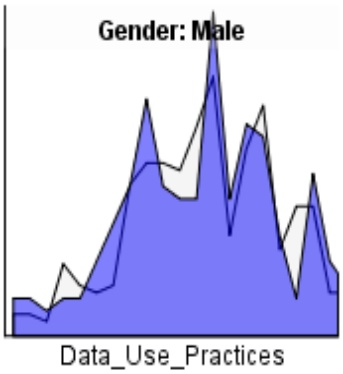

Figure 1

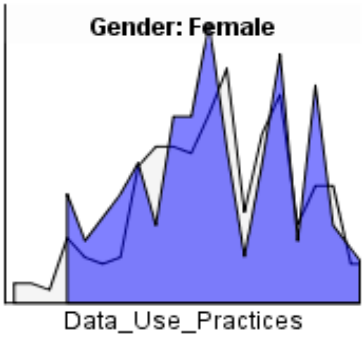

Figure 2

As shown in Table 1, majority (n=150, 100%) of the teachers who served as the participants of the study indicated that they use data from assessment to plan their classroom instruction, that is, to know the kind of teaching method and materials to use. All the participants (n=150, 100%) also unanimously accepted that they use assessment data to evaluate the learning progress of their students. Again, all the participants (n= 150, 100%) agreed that assessment data help them to evaluate teaching effectiveness for the past academic year, which subsequently may inform planning of the new one. Further, majority (n=120, 100%) of the participants agreed that they are able to know the curriculum strands to emphasize by looking at the assessment data. Majority (n= 98, 65%) participants also get to know past items to drill final year students on based on the assessment data of the past academic year. However, for most (n= 119, 79%) of the participants getting to know strength and weakness of their students and also to put the students into groups, (n= 138, 92%), was not by means of assessment data of the past academic year. Majority (n= 100, 67%) of the participants disagreed that they use assessment data for the purposes of sharing with colleague teachers and also for discussing with parents (n= 137, 91%). In all, responses were not different for both male teachers and female teachers (refer to Figure 1 and 2). Concluding, the analysis of the data point to the fact that participants use assessment data for the purposes of planning instruction, evaluating students' progress, determining curriculum strands to emphasize and also to evaluate instructional effectiveness for the academic year. The findings further reveals the significance of external examination data (i.e. Basic Education Certificate Examination results) not only for national discussions around progress or otherwise of the education system but also for the teachers' instructional management decisions.

4. Hypothesis

H_0: Teacher perception about assessment will not significantly affect assessment data use.

The hypothesis sought to examine how teacher perception (belief) about assessment (i.e. measured with belief scale) substantially affect they use assessment data. The hypothesis was tested using Partial Least Square (PLS) estimates. Summary of the analysis is shown in Figure 3 and Table 2.

Prior to the testing of the hypothesis, the research data was checked for fitness. Indicators for goodness of fit that support the analysis of variance based structural equation modelling were inspected and they were all within accepted level. For example, CMIN/DF was 2.0, CMIN/DF ($\chi 2$ / *df*) is the minimum discrepancy divided by its degrees of freedom; the ratio should be between the range of 1 to 3 for acceptability (Arbuckle, 2005). Also, RMSEA which is the population root mean square error of approximation was also inspected and the index was .04. According to Arbuckle (2005), the RMSEA value of about 0.05 or less would indicate a close fit of the model in relation to the degrees of freedom. Finally, the Comparative Fit Index (CFI) was also checked and an index of .90 was seen. CFI values close to 1 indicate a very good fit.

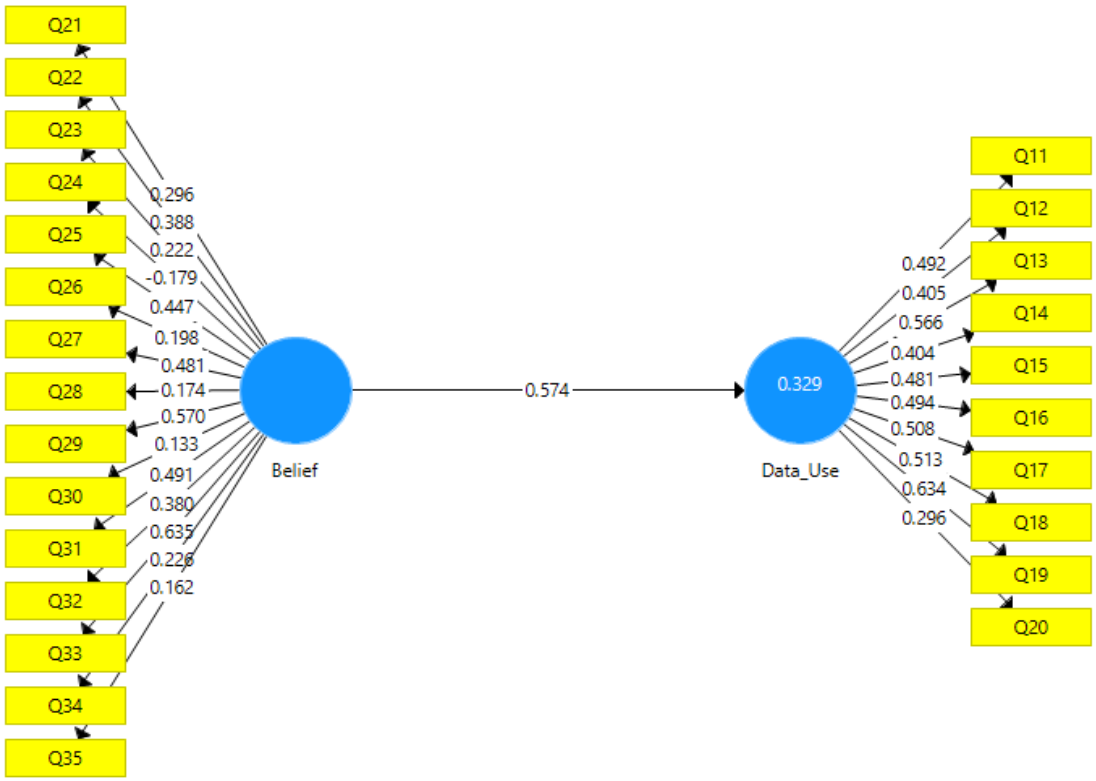

Figure 3. Measurement Model (CFA).

Table 2. PLS Structural Estimates (Hypothesis testing)

Hypothsis	Beta	t-value	Decision	p-value
H0: Belief→Data_Use	.574	3.718	Rejected	.000

Alpha= .05 (2-tailed) R^2=.329

The general idea was to investigate effect of teacher perception (belief) about assessment on teacher use of assessment data (measured on continuum). In line with this, results showed that teacher perception (or belief) about assessment significantly affect teacher use of assessment data (B= .574, t= 3.718, p=.001). further analysis showed that teacher positive perception about assessment explains 32.9% of the variances in assessment data use. This implies that teachers' willingness to use assessment data is to a greater extent determined by their perception about assessment in general.

5. Discussion of the Results

The use of assessment data from nationwide test results (i.e. Basic Education Certificate Examination) by basic school teachers was an objective in this study. Findings revealed that basic school teachers frequently use assessment data to plan instruction, evaluate students' learning progress, determine curriculum strands to emphasize during teaching

sessions and also to evaluate instructional effectiveness for the academic year. The findings are not surprising since most of these teachers in question are professional teachers, which as part of their training took at least a course in assessment in schools, and therefore know the importance of assessment with respect to classroom management decisions. Using assessment data by teachers to plan instruction and determine which strand(s) to emphasize, only points to Scriven (1967) suggestion that assessment data could be relevant for formative purposes. Once again, teachers use of assessment data to evaluate students' learning progress for the academic year aligns with Warring (2015) assertion that assessment data is important when one want to evaluating a broad range of students' characteristics on the same set of academic standards, measured in the same way.

The study finding further implies that when teachers have good perception about assessment, they are able to use assessment data judiciously to improve teaching and learning. At least when a teacher knows the curriculum objective he/she should emphasize because of information gathered from assessment data, it may suggest appropriate data use practices among teachers. Generally, the idea that teachers use assessment data to manage instruction and also to gauge effectiveness of instruction is a positive practice that agrees with several studies (William, 2011). In all, assessment data use practice serves the purpose of investigating prior knowledge, diagnosis and also to obtain information about instructional effectiveness (Crisp, 2012; Keeley & Tobey, 2011).

The impact of 'assessment perception' on 'assessment data use' was also investigated. finding of the study revealed that teacher perception (i.e., belief) about assessment data to a larger extent affect assessment data use. Teachers who have positive perception about assessment in general, that is, teachers who think that assessment data has the potential to guide them to make relevant instructional decisions, are more likely to use assessment data. Similarly, teachers with negative belief or perception about assessment may not utilize same. The study finding corroborates with that of Prenger and Schildkamp (2018) who discovered that teachers with positive dispositions or beliefs toward the utility and value of assessment data were more likely to use those data to inform their own instructional practices. In agreement with recent studies, Copp (2016) also postulated that teacher belief or conception about assessment substantially affect modification of instruction among teachers. Instruction change are often based on tests result, that is, when teachers have the confidence in assessment data as a true reflection of students' abilities in specific areas of academic endeavor (Remesal, 2011).

6. Conclusions

Based on the findings of the study, it is worth concluding that basic school teachers who served as the study participants make good use of assessment data. This practice is likely to be born out of a positive perception of assessment. The implication is that, when this practice is sustained, conducive learning environment is likely to be created that would have a rippling effect of maximizing learning outcomes. Moreover, it is implied from the study findings that teachers who make use of assessment data have positive perception about the relevance of assessment. For standard educational practice and for maximization of teaching gains, conversations around educational importance of assessment should be encouraged among teachers.

Recommendations

Based on the findings of the study, the study recommends that:

1. Tertiary institutions that train teachers should continue to place much emphasis on the teaching of 'assessment in schools' course to deepen prospective teachers' knowledge and utilization of assessment data for sustenance of positive 'assessment data use practices' in Ghana basic schools.
2. In attempt to sustain and improve assessment data use practices, Ghana Education Service must engage various experts in educations, especially, those in the area of Educational Measurement and Evaluation for each school district to serve as resource persons to facilitate workshops within school districts.
3. As in the case of tertiary institutions in Ghana, basic schools should have assessment officers that would keep store of school internal assessment data records and also liaise with West Affrican Examination Council (WAEC) for external examination data for teachers' perusal.

7. Limitations and Future Research Directions

The study made use of only basic school teachers within Central region of Ghana, therefore the interpretation of the findings should be done with caution, especially, generalizing results of this study to other administrative regions in the country. Even though the percentage of the explained variance in the outcome variable by the predictor variable in the model was statistically significant, there was still a considerable proportion of unexplained variance in the outcome variable, suggesting that additional variables, not measured in this instance, or model may also have a role to play in explaining the criterion variable as well, caution must therefore be exercised. Future researchers should be guided by this study and replicate same among samples of pre-tertiary and tertiary institution teachers to increase the generalizability of this study.

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