Headteachers' Instructional Leadership Practices as Predictors of Teachers' Continuous Professional Development in Ghanaian Public Basic Schools: Structural Equation Modelling Approach

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ABSTRACT

The study sought to examine the causal effect of headteachers' instructional leadership practices on teachers' continuous professional development in Ghanaian public basic school context. The study employed the causal-comparative research design within the positivist quantitative framework, involving 127 headteachers and 643 teachers who were selected through census and proportionate stratified random sampling techniques respectively. Questionnaires were used to collect data, which was analysed through the covariance-based structural equation modelling (CB-SEM). Analysis of the path coefficients revealed that instructional leadership practices predicted a statistically significant 41.3% to teacher continuous professional development. Further examination of the path coefficients established that instructional leadership practices accounted for a statistically significant 41.7% to teacher knowledge, 45.4% to teacher professional values and attitudes as well as 42.2% to teacher professional practice respectively. Consistent with these findings, it was concluded that the headteachers' instructional leadership practices were good predictors of teachers' continuous professional development in the public basic schools in Ghana. Therefore, the study recommended that the headteachers should be supported and oriented to intensify their instructional leadership practices so as to enhance the continuous professional development of the teachers in public basic schools in Ghana.

Keywords: Headteachers, instructional leadership, teachers' continuous professional development, district, education circuit

INTRODUCTION

Researchers and education practitioners maintain that quality teachers are at the core and pivot of any educational reform agenda. Several researchers and academics (Nortey, 2021; Senyametor, Nkrumah, Dankyi, & Asare, 2021) support this viewpoint when they contend that quality teachers are crucial determinants of the effectiveness or otherwise of any education policies, programmes, and innovations. Nortey (2021) and illumes that teachers execute educational reforms, and the extent to which these reforms are effectively implemented is contingent on the calibre of these teachers. Instructive that reforms in education require novelty in instructional matters, Senyametor et al. (2021) implore teachers to seek and apply ingenuity in the implementation of education reforms. Baafi (2020) and Buabeng, Ntow and Otami (2020) are convinced that teachers impact educational attainments of learners, particularly in deprived settings. Accordingly, Cisneros-Cohernour (2021) and Saka (2021) allude to low quality of teachers as the prime cause of low academic achievement of learners in various countries. Consistent with the preceding perspectives, it is inferred that a country's educational system cannot be better than the quality of teachers who implement education agendas. Thus, the training and deployment of quality teachers to educational institutions is a concern to all governments and education providers.

Extant literature identifies pre-service and in-service training as crucial opportunities in producing quality teachers (Fairman, Smith, Pullen, & Lebel, 2020). These authors explicate pre-service teacher training as the

initial preparation of teachers prior to deployment into the teaching service, while in-service teacher training takes place while the teacher is in active service. Education reforms in relation to teacher pre-service training have been implemented in Ghana to enhance the quality of teachers at the basic education level. For instance, the Government of Ghana introduced a four-year programme in the Colleges of Education (CoE) under the Transforming Teacher Education and Learning (T-TEL). The T-TEL programme is funded by the government of the United Kingdom with the aim to reform teacher education during pre-service in Ghana so as to enhance quality instruction in the country. It is therefore presummed that quality teachers would be produced in Ghana through the pre-service channel.

However, scholars like Nortey (2021) and Abdulrazak (2020) underscore the significance of continuous teacher improvement after the initial pre-service education. Despite the recognition that pre-service teacher education is capable in equipping teachers with the necessary proficiencies to work effectively throughout their profession, these authors aver that the pre-service teacher education is limited in preparing teachers for all uncertainties, hence acquisition of new competencies are necessary to tackle future challenges and demands. Therefore, teacher training through pre-service and in-service as mutually inclusive, hence these two training pathways do not lie at the extreme ends of a continuum. This claim illuminates that, both pre-service and in-service teacher education are inseparable channels for producing quality teachers for any education systems. Consequently, scholars (Abdulrazak, 2020; Özer, Can, & Duran, 2020) call for continuous in-service professional development programmes to keep teachers abreast with new developments in the education enterprise, improve instructional practices, which ultimately lead to quality education delivery. Consistentent with this assertion, the researchers argue that continuous professional development of teachers is necessary for enhancing the quality of teachers as well as learning outcomes of students.

Scholars proffer arguments to support the relevance of continuous professional development for all professionals, including teachers. Scholars contend that continuous professional development has become important in all organizations to equip employees with the requisite competencies in their respective fields, be abreast with the dynamics of the society and technological innovations, and make them have a competitive edge over their rivals (Kordzadze, 2020; Yaqub, Owusu-Cole, & Ofosua, 2020). Studies conducted in Ghana suggest that, continuous professional development for teachers is essential in promoting quality education and the realization of educational goals. For instance, Ibrahim (2020) discovered that continuous professional development is significant to apprise teachers with innovative ways of instruction at the CoE and the basic school levels respectively. In relation to the implementation of educational reforms, researchers and education practitioners maintain that apposite continuous professional development empowers teachers to effectively execute educational reforms, and fill the knowledge gap between the competencies that teachers receive in their pre-service and the demands of educational reforms (Coffie, Aboagye, & Johnson, 2020; Ibrahim, 2020). Another strand of argument in favour of continuous professional development for teachers points out that, it boosts the effectiveness and performance of teachers and the entire school (Nortey, 2021; Dampson, Antor, & Eshun, 2018). In the classroom, several researchers in Ghana (Baafi, 2020; Abreh, 2018) concede that continuous professional development helps to enhance instructional practices and assessment strategies of teachers, and ultimately leads to the improvement of learning outcomes in Ghanaian learners. The researchers align with the preceding views that continuous professional development for teachers is an integral determinant of quality education, and it is a crucial element to gauge learning outcomes of learners in various jurisdictions.

Convinced that continuous professional development impacts education delivery, countries take steps to promote continuous professional development delivery to teachers. To illustrate, the United States of America spends about $5,625 on each teacher yearly in public K–12 schools, totalling approximately $18 billion annually on continuous professional development provision for teachers (Sharrock & Parkerson, 2020). These authors further argue that this investment is insignificant considering the role that continuous professional development is expected to play in education provision. In Asia, Oman Ministry of Education designated an institution called the “Specialised Centre for Professional Training of Teachers” in 2014 to

spearhead continuous professional development of teachers. Likewise, Ghana implements policies and programmes to promote continuous professional development for teachers, especially at the basic education level. For example, the National In-service Training (INSET) division of Ghana Education Service (GES), and the Pre-Tertiary Teacher Professional Development and Management (PTPDM) Policy are intended to champion continuous professional development provision at the pre-tertiary education level in Ghana (Abonyi, Yeboah, & Luguterah, 2020; Annan, 2020).

Consequently, the GES and Non-Governmental Organizations (NGOs) organize several continuous professional development programmes for teachers at the basic education level in Ghana (Perry & Bevins, 2018). In 2020, the government of Ghana instituted continuous professional development annual allowance of GH¢1, 200.00 for teachers in pre-tertiary education level to support continuous professional development of the teachers (Ghana News Agency, 2020). In addition, as part of the 2019 educational reforms, GES introduced Continuous Professional Development Day for kindergarten and primary school teachers in public basic schools in Ghana, where teachers are required to observe four continuous professional development days in an academic year (Graphic.com, 2019). The continuous professional development day is devoted for teachers to participate in continuous professional development activities with the aim to enhance the competences of the teachers so as to boost the learning outcomes of learners. The National Teaching Council (NTC) is also charged to spearhead continuous professional development of teachers by organising programmes for teachers to accumulate scores for renewal of teachers' license (NTC, 2020). It is therefore evident that, countries including Ghana invest in the continuous professional development of their teachers with the belief that it contributes significantly in enhancing teacher quality and learning outcomes of students.

Despite efforts made in promoting the continuous professional development of teachers globally, researchers and academics censure the organization and implementation of continuous professional development in several countries, and Ghana is no exception. According to Fairman et al. (2020), continuous professional development programmes in most countries are deficient in advancing teachers' capacities and academic attainment of learners. In the United Kingdom and Ethiopia, for instance, Skipp and Dommett (2021) discovered that continuous professional development for teachers were ineffectively organized, and there was a drop in the provision of these programmes in the UK in spite of teachers' willingness to participate in such programmes (Sellen, 2016). This author compared continuous professional development days in several countries, and concluded that teachers in England are required to attend continuous professional development programmes for four days annually, while teachers in Organization for Economic Cooperation and Development (OECD) countries and Shanghai in China are expected to participate in ten and a half days and 40 days continuous professional development programmes in a year respectively. Researchers also cited inadequate time and funding for continuous professional development in Punjab (China) and Saudi Arabia (Aldahmash, Alshamrani, Alshaya, & Alsarrani, 2019).

Other researchers note that the traditional top-down approach to continuous professional development programmes where external experts deliver these programmes fail to address the needs of teachers in the classroom context (Dehghan, 2020; Mumhure, Jita, & Chimbi, 2020). Consequently, Ford, Baldwin and Prasad (2018) estimate that about 10% to 15% of knowledge gained in continuous professional development programmes account for changes in attitudes of staff in an organization. In Oman, Al Balushi (2021) stated that, poor timing and location, and the bureaucratic top-down approach to continuous professional development delivery were major drawbacks to these programmes for teachers in the country. Similarly in Ghana, criticisms of continuous professional development for teachers include unavailability of programme materials, poor lodging and feeding arrangements (Abdulrazak, 2020), absence of needs analysis to identify training needs of teachers (Yaqub et al., 2020), inability of teachers to transfer skills and knowledge acquired in continuous professional development programmes to their instructional practices in the classroom (Abonyi et al., 2020), time pressures, inadequate funding, content irrelevance to teachers' classroom tasks, and lack of support from school leaders (Edwards & Osei-Mensah, 2019). In addition, Nortey (2021) and Annan (2020) observed that there is a shift in the purpose of continuous professional development in Ghana from

improving teachers' competence and increasing learning outcomes of students to meeting requirements for promotion and probable salary increment. These pitfalls in the continuous professional development programmes for teachers in Ghana and elsewhere imply that these programmes are ineffective to hone teacher quality and ultimately, improve the academic achievement of learners. Considering these bottlenecks that bedevil continuous professional development programmes in Ghana, it is imperative to investigate the level of continuous professional development among teachers in the study context.

To find proactive and sustainable ways of enhancing the continuous professional development of teachers, researchers and academics conduct investigations to discover approaches that are appropriate in specific settings. Meanwhile, school leadership has gained traction among academics and researchers in recent times as reliable in deepening the continuous professional development of teachers as well as the academic attainment of students. Researchers establish that school leaders contribute significantly towards the professional development of teachers as they provide guidance, and support (Senyametor et al., 2021; Strand & Emstad, 2020). Furthermore, Fatih (2020) and Sterrett and Richardson (2020) contend that, even though teachers are in charge and accountable for their professional development, school leadership is essential in providing the motivation, support, and opportunities for teachers' professional development. In terms of student learning, leadership theorists assert that, school leadership plays a crucial role in enhancing school effectiveness, teacher performance, and academic achievement of learners, and it comes second to classroom instruction among factors that impact learning (Dami et al., 2022; Leithwood, Harris, & Hopkins, 2020).

Interest and emphasis on school leadership has heightened in recent decades due to the increase accountability and pressure on schools to improve learning outcomes of students (Leithwood et al., 2020; Levin, Leung, Edgerton, & Scott, 2020). Indeed, countries like Vietnam which pay attention to the competence of school leaders attain progress in teacher and instructional quality, and the realization of educational goals (Gian & Bao, 2021; Hallinger, 2020). Therefore, Alshehhi and Alzouebi (2020) urge selecting authorities to carefully select school leaders due to the enormous tasks that are associated with their role in ensuring effectiveness of the school. The researchers therefore affiliate with the preceding perspectives, and theorize that the contribution of school leadership to improvement in professional development of teachers and student educational achievement is not in doubt. What is in doubt, however, is the kind of leadership that is potent to yield desired outcomes.

Leadership literature is replete with plethora of leadership types; hence scholars concede that there is no single leadership type that assures the effectiveness of an organization which makes leaders to practice diverse types of leadership (Fullan, 2020; Hallinger, 2020). However, instructional leadership has gained ground among researchers and policy makers as efficacious and reliable in promoting continuous professional development of teachers and student learning outcomes. Scholars hold the view that instructional leadership is crucial for school effectiveness because it is the only type of leadership that is exclusively designed for educational institutions (Karacabey, Bellibaş, & Adams, 2022). In a meta-analysis carried out by Robinson, Lloyd and Rowe (2008), they found that instructional leadership contributes three to four times to student learning more than transformational leadership. Boyce and Bowers (2018) further maintain that instructional leadership theory provides the leadership framework for conceptualizing and assessing successful schools. Scholars argue that the core mandate of the school is to promote teaching and learning, and school leadership should be tailored in this direction (Wahab et al., 2020; Gawlik, 2018). To this end, it is imperative that school leaders practice the instructional leadership which focuses primarily on enhancing the quality of teachers' instructional practices and student academic attainment (Mora-Ruano, Schurig, & Wittmann, 2021; Hallinger, 2020). Therefore, policy makers in countries like Israel prioritize instructional leadership among school leaders (Shaked, Benoliel, & Hallinger, 2020). Due to its significance to school improvement, instructional leadership engages the attention of educational researchers since the late 1970s than any other type of leadership (Hallinger, 2020; Sibomana, 2020). In line with these claims, the researchers deduce that improving the practice of instructional leadership in the Ghanaian public basic schools would guarantee quality instruction and academic attainment of learners.

The researchers glean from the preceding arguments that, instructional leadership and teachers' continuous professional development are crucial determinants of academic achievement among learners. Therefore, the central thesis that informs and guides this study is that, the practice of instructional leadership among headteachers in public basic schools in Ghana enhances teachers' continuous professional development. However, there are controversies with regards the effect of instructional leadership on continuous professional development of teachers, and researchers and academics continue to debate the nature and complexity of the relationship among these constructs (Veleti & Olsen, 2020). This debate is aroused by contradictory findings in the field. For instance, Ibrahim (2020) and Hallinger, Liu and Piyaman (2017b) indicated that instructional leadership has a direct effect on the continuous professional development of teachers. Therefore, it is instructive that one of the ways to promote the continuous professional development of teachers in the Ghanaian public basic schools is to enhance the instructional leadership practices of headteachers.

It is therefore expected that school leaders would practice instructional leadership effectively in their schools. Contrary to this expectation, leadership literature recounts that school leaders are unable to enact instructional leadership effectually due to challenges they encounter in their schools. For example, Fred and Singh (2021) noticed that, the functions of school leaders are numerous and complex, making most leaders to prioritize administrative matters and renege on their instructional responsibilities. Other challenges include institutional values, inadequate knowledge of school leaders in instructional matters, and apprehension among leaders of possible destruction of cordial relationships with teachers in an attempt to exercise instructional leadership roles (Murphy, Neumerski, Goldring, Grissom, & Porter, 2016). Furthermore, the understanding of instructional leadership and its practice vary across cultures and leaders, hence affects the extent to which the instructional leadership is practiced in schools (Hallinger & Walker, 2017). These challenges seem to suggest that school leaders are unable to perform their instructional leadership roles effectively in their schools. However, due to the dearth of empirical evidence to support this claim in Ghana, the researchers sought to investigate the extent to which headteachers in public basic schools practice instructional leadership in their schools.

Another challenge that impedes the effective practice of instructional leadership among school leaders is the multiplicity of instructional leadership frameworks and models (Adams, Mombourquette, & Townsend, 2019) that put school leaders in a dilemma in the choice and practice of the model that is most probable to produce success. Instructional leadership models specify the behaviours that leaders are required to exhibit, and this has been an issue of contention due to numerous models in the field (Boyce & Bowers, 2018). Townsend (2019) cites instructional leadership models including Bossert, Dwyer, Rowan and Lee (1982), Leithwood and Montgomery (1982), Hallinger and Murphy (1985), and Andrews and Soder (1987). However, Sibomana (2020) observes that studies on the best instructional leadership model are scarce across the globe. In Ghana, it appears there is no prescription of the precise instructional leadership model to use in public basic schools to enhance teachers' continuous professional development and the learning outcomes of learners, which calls for an investigation to examine which instructional leadership is applicable in the Ghanaian education context. The choice of the Ghanaian context is crucial because instructional leadership originated from the western world, hence it possesses western cultural and contextual attributes which affect how it is practiced elsewhere (Liu, Li, & Huang, 2022; Brewer, Okilwa, & Duarte, 2020).

However, the preference for Hallinger and Murphy's (1985) model of instructional leadership in promoting continuous professional development of teachers has caught the attention of researchers and academics over decades. Firstly, this model is widely adopted and employed in research since its formulation (Hallinger & Wang, 2015). Secondly, there is ample proof that this model is robust in promoting school effectiveness including learning outcomes of students (Margaretta & Isnaeni, 2020; Liu & Hallinger, 2018). To this end, there are theoretical and empirical justifications that instructional leadership of headteachers and teachers' continuous professional development are good predictors of academic attainment of learners. In relation to continuous professional development, there is an emerging direction in research where studies involving teacher continuous professional development shift from examining the form, models, and settings of

continuous professional development to assessing its impact (Thurlings & den Brok, 2017) like academic achievement which is the ultimate goal of continuous professional development (Shabibi, Mantheri, & Rashdi, 2019; Wolf & Peele, 2019). Therefore, the researchers are certain that the choice of instructional leadership as antecedent of continuous professional development of teachers is a cardinal field of analytical study.

It is expected that the findings of the study would provide relevant empirical evidence that will inform decisions in supporting heads of schools to improve their instructional leadership practices to boost teachers' continuous professional development. The findings of the study will inform education providers to enact evidence-based interventions and programmes in terms of instructional leadership practices that are most probable to heighten continuous professional development among teachers. Additionally, the findings will provide fresh insights to researchers and academics to deepen their understanding of the mechanisms through which instructional leadership affects continuous professional development of teachers. This will contribute to the growing interest of research in the field.

LITERATURE REVIEW

Hallinger and Murphy's (1985) instructional leadership theory, and teacher professionalism model postulated by National Teaching Council (NTC) (2020) constituted the theoretical framework of the study. The instructional leadership theory originated from the United States of America in the 1970s where public schools recorded low learning outcomes (Townsend, 2019). This author adds that this leadership type was strategically designed to enhance learning outcomes. According to Shaked (2021), this instructional leadership theory focuses on the accomplishment of tasks, rather than fostering relationships in organizations. The nomenclature of this instructional leadership has three dimensions, including defining the school mission, managing the instructional programme, and developing a positive school learning climate (Abonyi, Adjei-Boateng, & Ansaah, 2022; Dita, Leele, & Norazah, 2022).

The National Teachers' Standard was introduced in Ghana in line with government directives that guide teacher training and development to ensure competent professional knowledge, values and attitudes, and professional practice of teachers necessary for the delivery of quality education to the Ghanaian child (Ananga, 2021; NTC, 2020). These standards present a set of expectations that guide stakeholders involved in teacher education and continuous professional development in pre-service and in-service respectively (Buabeng et al., 2020). These standards include the knowledge, skills, attitudes, and values that a professional teacher at the pre-tertiary education level should possess and exhibit in school and in the larger community.

The NTS is classified into three domains, and each domain has components (NTC, 2020). One of these domains is professional values and attitudes. It comprises professional development, and community of practice; professional knowledge includes knowledge of educational framework and curriculum, and knowledge of learners, while professional practice is composed of managing the learning environment, teaching and learning, and assessment (NTC, 2020). Buabeng et al. (2020) note that, the three domains in the NTS are not separate entities, but they are intertwined with one another with the view of developing holistically competent teachers for the Ghanaian basic schools. Therefore, the NTS provides a benchmark for assessing teacher quality for the purposes of certification, licensing, continuous professional development, and policy formulation at the pre-tertiary education sub-sector in Ghana.

Several studies have been conducted to examine the effect of instructional leadership on teachers' continuous professional development. In Ghana, Agyeman-Nyarko and Dzakadzie (2021) conducted a study on the effect of instructional leadership of principals in Colleges of Education (CoE) on the continuous professional development of tutors. The researchers sampled 480 participants for the study through simple random and cluster sampling strategies. The cross-sectional survey design within the quantitative approach was employed to carry out the study. Data were collected on instructional leadership and continuous professional development through self-constructed questionnaires. The data were analysed through descriptive statistics

like mean and standard deviation as well as inferential statistics, specifically multiple linear regression. Generally, the findings of the study revealed that instructional leadership significantly affected the continuous professional development of the tutors ($F=54.735$, $p=0.001$). Even though this study provides a justification on the need for instructional leadership in enhancing teacher continuous professional development, the researchers did not report the magnitude of the effect of the overall instructional leadership behaviour on the continuous professional development of the tutors.

Hosseingholizadeh et al. (2020) investigated instructional leadership, collective efficacy, commitment, and professional learning of teachers in primary schools in Iran. The researchers involved school heads and teachers from 230 primary schools located in Mashhad City, the second most densely populated cities in Iran. The cross-sectional survey research design within the quantitative framework was used in the study. The PIMRS developed by Hallinger and Murphy (1985) was utilised to collect data in the study. The data were analysed using the confirmatory factor analysis (CFA) and structural equation modelling (SEM) approach. Having ascertained that the model fit indices were adequate, the researchers examined the path coefficients of the various variables, and the findings showed that, the instructional leadership practices of the school heads directly and significantly affected teacher continuous professional development ($\beta=0.41$, $p< 0.001$). This finding implied that, instructional leadership practices in the Iranian primary schools predicted the continuous professional development of the teachers. Based on these findings, The researchers infer that instructional leadership has effect on teacher knowledge and teacher skills components of continuous professional development.

METHODOLOGY

The study employed quantitative research approach within the positivist paradigm. The causal-comparative research design was adopted for the study. This design, also known as the ex post facto research design (Patten & Newhart, 2018), is a non-experimental research design within the quantitative methodology which enables researchers to determine the effect of one or more variables on another variable (Cohen, Manion, & Morrison 2018). Therefore, researchers applying this design do not implement treatments or interventions as is the case in experimental designs (Patten & Newhart, 2018). According to Patten and Newhart (2018), the causal-comparative research requires that a researcher observes an existing circumstance (effect), and retrospectively attempts to ascertain what accounts for the occurrence of the condition (cause). Despite the criticism that findings from causal-comparative studies are unable to provide adequate grounds to establish causality due to its inability to manipulate the causal variable so as to assess its effect on the outcome variable as well as control extraneous variables (Hegde & Salvatore, 2021), the researchers chose this design because permits researchers to establish cause-and-effect relationship in the social sciences, especially when the study involves humans as well as when all extraneous variables cannot be controlled (Patten & Newhart, 2018). The researchers held the view that it would be difficult to control all other variables that are likely to affect the continuous professional development of the teachers which made the causal-comparative research design appropriate for the study.

The target population for this study was 1170, comprising 127 headteachers, and 1043 teachers. The sample size for the study was 770, comprising 127 headteachers and 643 teachers. The researchers considered this sample size as adequate because scholars like Kline (2020) advocate for large samples in studies involving covariance-based structural equation modelling (CB-SEM), where the sample size should be at least 200 participants more than 8 times the number of variables included in the model. The headteachers and teachers were selected through census and proportionate stratified random sampling techniques respectively. Therefore, all the 127 headteachers were selected for the study because census sampling involves the selection of all members in a defined target population for a study (Hair, Ortinau, & Harrison, , 2021). The preceding authors vouch for the choice of the census frame in selecting research participants as it helps to eliminate sampling error and enhances the internal validity of findings. The researchers opted for the proportionate stratified random sampling technique in selecting the teachers because it ensures that that all subgroups with different sizes relative to the population are fairly represented in the sample so as to be representative of the population as well as its ability to minimise sampling error (Leedy & Ormrod, 2021).

The teachers were categorized by district, and based on the number of teachers in each district, the researchers calculated the proportions of teachers in each district. Then, these proportions were used to determine the sample size for each district relative to the sample size of teachers for the study. For instance, out of the 643 teachers to be selected for the study, the researchers selected 469 (73% of 643) from the first district, and 174 (27% of 643) from the second district. After this, the researchers calculated the proportions of male and female teachers in each district, and these proportions were used to select the males and females in each district. The figures showed that the researchers selected 131 males (28% of 469) and 338 females (72% of 469) from District X, and 89 males (51% of 174) and 85 females (49% of 174) from District Y. In all, 220 male teachers and 423 female teachers were selected from the two districts for the study as presented in Table 1.

Table1: Distribution of Teacher Sample by District and Gender

Districts	**Number of Teachers in the Districts**			**District Sample**	**Male Sample**	**Female Sample**
	Male	**Female**	**Total**			
X	212 (28%)	553 (72%)	765 (73%)	469	131	338
Y	143 (51%)	135 (49%)	278 (27%)	174	89	85
Total	**355**	**688**	**1043**	**643**	**220**	**423**

Source: Researchers' Computations, 2023

Subsequently, the researchers classified the teachers based on their education circuits, and determined their percentages relative to the total number of teachers in each circuit. Thereafter, the proportions of males and females in each circuit were calculated, and these proportions were used to determine the males and females in each district. For instance, 14 males (11% of 131) and 51 females (15% of 338) were selected from Circuit A in District X. The researchers applied the simple random sampling technique through the RAND method in Microsoft Excel to select the teachers from each stratum as recommended by researchers (Collis & Hussey, 2021). First, all the prospective participants in each circuit were assigned identification numbered. For instance, all the 23 male teachers in Circuit A were numbered from 1 to 23. Then, in cell A1 of Microsoft Excel, the researchers selected Math and Trig. function in Formulas, chose RAND in the drop-down menu, then ok. This command generated series of decimal numbers in A1. Subsequently, random numbers between 1 and 23 in cell B1 were generated using the =Randbetween(1,23) command, and the first 14 random numbers which represented each prospective participant were selected to represent the males in Circuit A of District X.

Questionnaires were used to collect data in the study. The questionnaires were the Headteacher Instructional Management Rating Scale (HIMRS) adapted from Hallinger and Murphy's (1985) instructional leadership model, and the Teacher Continuous Professional Development Rating Scale (TCPDRS) which was self-constructed in line with the National Teachers' Standards (NTS). Hallinger and Murphy's (1985) instructional leadership questionnaire, called the Principal Instructional Management Rating Scale (PIMRS), contains three major scales, including defining the school mission, managing instructional programme, and promoting school climate. Defining the school mission has two subscales (framing school goals, communicating school goals); managing instructional programme contains three subscales (supervising and evaluating instructions, coordinating curriculum, and monitoring students' progress); and promoting school climate has five subscales (protecting instructional time, promoting professional development, maintaining high visibility, providing incentives for teachers, and providing incentives for students). Each of the subscales has five items, making a total of fifty items for the ten subscales. However, promoting professional development subscale of the questionnaire was dropped in this study because it relates with the continuous professional development used as the dependent variable in the study. In all, forty-five items were involved in the initial HIMRS. The variables in this instrument were measured on a 5-point Likert scale such that 5 represents almost always, 4 represents frequently, 3 represents sometimes, 2 represents seldom, and 1

represents almost never. The TCPDRS contained three subscales, including professional values and attitudes, professional knowledge, and professional practice, and there were 6, 8, and 9 items for each construct respectively prior to pre-testing, totalling 23 items in the TCPDRS. Items on the TCPDRS were measured on a 5-point Likert scale such that 5 represents strongly agree, 4 represents agree, 3 neither agree nor disagree, 2 represents disagree, and 1 represents strongly disagree.

The questionnaires were pre-tested among 68 participants, comprising 17 headteachers and 51 teachers to assess their validity and reliability. This sample size was deemed adequate for the pre-test study based on expert recommendation that a minimum of 30 participants is adequate in pre-testing an instrument (Abu-Bader, 2021). Face validity, content validity, and construct validity were measured. Cohen's Kappa Index (CKI) was applied to assess face validity. The CKI is a measure of inter-rater agreement which indicates the extent to which two or more raters or observers agree or disagree on the items that measure a construct (Denis, 2020). To do this, the researchers randomly selected one retired headteacher and one retired teacher to rate their agreement to each item of the questionnaires by indicating either "Yes" to represent agreement or "No" to show disagreement. Then, the researchers computed kappa coefficient in SPSS to determine the extent of agreement where kappa coefficient of at least 0.60 is indicative of acceptable face validity (Landis & Koch, 1977) where kappa coefficient of 0.793 was obtained as in Table 2.

Table 2: Cohen's Kappa Coefficient Results

			Rater2		**Total**	**Measure of Agreement Kappa**	
			No	**Yes**			
Rater1	No	Count	2	1	3	Value	0.793
		% within Rater1	66.7%	33.3%	100.0%	Asymp. Std. Error[a]	0.201
		% within Rater2	100.0%	1.5%	4.4%	Approx. T[b]	6.682
		% of Total	2.9%	1.5%	4.4%	Approx. Sig.	0.000
	Yes	Count	0	65	65		
		% within Rater1	0.0%	100.0%	100.0%		
		% within Rater2	0.0%	98.5%	95.6%		
		% of Total	0.0%	95.6%	95.6%		
Total		Count	2	66	68		
		% within Rater1	2.9%	97.1%	100.0%		
		% within Rater2	100.0%	100.0%	100.0%		
		% of Total	2.9%	97.1%	100.0%		

Source: Fieldwork Data (2023)

The researchers followed the Content Validity Index (CVI) procedure to establish the content validity of the questionnaires. Content validity through the CVI was determined in two ways, including Item Content Validity Index (I-CVI), and Scale Content Validity Index (S-CVI) where two experts rated the relevance of each item in the questionnaires on a 4-point rating scale. After the supervisors' rating, the researchers recoded the ratings such that 1 and 2 were recoded as 0, while 3 and 4 were recoded as 1. This implied that 0 meant the item was not relevant, and 1 meant the item was relevant, and the ratings of the two experts were used to complete the relevance rating and scoring form. The findings showed that the I-CVI was 0.83 while the S-CVI was 0.86 which were within acceptable content validity index threshold of at least 0.80 (Nunkoo, Teeroovengadum, & Ringle, 2021).

Exploratory factor analysis (EFA) was used to determine the construct validity of the questionnaires. The researchers determined the suitability of the data for factor analysis, using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and the Bartlett's test of sphericity. The KMO score was 0.889 while the

Bartlett's test of sphericity value was statistically significant ($p<0.05$), which confirmed that the data was adequate and suitable for EFA.

Table 3: Test of Suitability of Data for Factor Analysis

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.889
Bartlett's Test of Sphericity	Approx. Chi-Square	11145.607
	df	1035
	Sig.	0.000

Source: Fieldwork Data (2023)

Then, factor extraction was carried out. The researchers applied the Principal Components Analysis (PCA) method to extract the factors using Kaiser's eigenvalue criteria. The findings in Table 4 showed that 11 factors were extracted for rotation, and they collectively contributed a total of 72.403 variance where framing school goals (FSG) contributed the highest variance (23.296) while professional values and attitudes (PVA) contributed the least variance (2.3580). This finding implied that items on maintaining high visibility did not load on their component, hence they were removed from the analysis. The researchers then rotated the 11 components retained by the extraction techniques by employing the varimax rotation technique within the orthogonal approach, which assumes that the factors were uncorrelated (Pallant, 2020). The factor loadings were supressed at 0.50, which meant that factors that loaded below 0.50 were removed from the analysis. After the factor rotation, 45 items in the initial HIMRS instructional leadership questionnaire were reduced to 33 items, while the 23-item questionnaire in the TCPDRS was reduced to 11 items.

Table 4: Exploratory Factor Analysis Results

	Components										
	1	2	3	4	5	6	7	8	9	10	11
FSG2	0.887										
FSG4	0.864										
FSG3	0.850										
FSG1	0.820										
FSG5	0.789										
PRIT4		0.788									
PRIT3		0.780									
PRIT5		0.773									
PRIT2		0.758									
PRIT1		0.748									
CSG3			0.870								
CSG5			0.858								
CSG4			0.846								
CSG2			0.807								
PP8				0.893							
PP7				0.884							
PP9				0.819							
PP6				0.701							
PP5				0.572							

PIT5					0.830						
PIT4					0.806						
PIT3					0.695						
PIT2					0.657						
PIT1					0.650						
PIL3						0.856					
PIL4						0.842					
PIL5						0.823					
PIL2						0.790					
MPP4							0.828				
MPP3							0.797				
MPP2							0.774				
MPP5							0.636				
SEI4								0.882			
SEI5								0.858			
SEI3								0.846			
PK2									0.788		
PK3									0.762		
PK4									0.655		
CC5										0.811	
CC3										0.776	
CC4										0.711	
PVA5											0.786
PVA6											0.694
PVA4											0.694
Eigenvalue	10.716	4.915	3.798	2.987	2.018	1.894	1.635	1.557	1.374	1.328	1.085
% of Variance	23.296	10.684	8.257	6.4930	4.3860	4.1170	3.555	3.3850	2.9860	2.8860	2.3580
Cumulative %	23.296	33.980	42.236	48.730	53.116	57.233	60.789	64.174	67.159	70.046	72.403

Source: Fieldwork Data (2023)

Reliability of the questionnaires was determined through internal consistency. The questionnaires were administered to the participants in the pre-test once, and the data was analysed with Cronbach Alpha coefficients for each subscale as well as the entire scale as shown in Table 5.

Table 5: Internal Consistency Results

Construct	**Cronbach Alpha**
Framing school goals	0.936
Providing incentives for teachers	0.894
Communicating school goals	0.940
Protecting instructional time	0.860
Providing incentives for learners	0.908
Monitoring learner progress	0.843
Supervising and evaluating instruction	0.891
Coordinating the curriculum	0.779

Overall instructional leadership	0.925
Professional practice	0.868
Professional knowledge	0.716
Professional values and attitudes	0.749
Overall continuous professional development	0.882

Source: Fieldwork Data (2023)

The Cronbach's Alpha coefficient of 0.70 or greater was indicative of acceptable reliability questionnaire as recommended by researchers (Verma & Abdel-Salam, 2019). After coding and entering the data into the SPSS, the data was cleaned. The data was then explored to identify and correct all missing data and outliers using frequencies. After data exploration, the structural equation modelling (SEM) analytical technique through the maximum likelihood estimation (MLE) was used to examine the extent to which headteachers' instructional leadership practices predicted teachers' continuous professional development. The researchers opted for the covariance-based SEM (CB-SEM) approach to test the hypothesized model in relation to instructional leadership theory and teachers' continuous professional model. The SEM analysis was conducted in two parts, including the measurement model, followed by the structural model. The measurement model specifies the relationship between the observed variables (indicators) and their respective latent (unobserved) variables, while the structural model indicates the relationship between two or more latent variables (Thakkar, 2020). Analysis of Moment Structures (AMOS) analytical software was used to specify the measurement model by linking the items to their corresponding variable as well as the unobserved latent variables. Confirmatory factor analysis (CFA) was conducted to test the psychometric properties of the measurement model in terms of composite reliability (CR), convergent validity (CV), and discriminant validity (DV). CR was estimated using values greater than 0.70 (Collier, 2020), while CV was assessed through the average variance extracted (AVE) greater than 0.50 (Hair et al., 2019). DV was estimated using Fornell and Larcker's (1981) technique where the square root of the AVE of a construct is greater than the correlation coefficient between two constructs.

Table 6: Results for Composite Reliability, Convergent Validity, and Discriminant Validity

	CR	**CA**	**AVE**	**MSV**	**MaxR(H)**	**PVAS**	**PRIL**	**PRITR**	**CORC**	**FSG**	**MPPP**	**CSG**	**PITM**	**SEVI**	**PKG**	**PPC**
PVAS	0.756	0.778	0.768	0.593	0.651	**0.876**										
PRIL	0.839	0.908	0.824	0.748	0.845	0.257	**0.908**									
PRITR	0.843	0.894	0.779	0.748	0.865	0.170	0.865	**0.883**								
CORC	0.805	0.779	0.699	0.637	0.818	0.317	0.685	0.689	**0.836**							
FSG	0.785	0.936	0.768	0.743	0.788	0.440	0.580	0.590	0.774	**0.876**						
MPPP	0.817	0.843	0.682	0.615	0.822	0.425	0.674	0.693	0.770	0.731	**0.826**					
CSG	0.798	0.940	0.761	0.743	0.814	0.467	0.630	0.624	0.798	0.862	0.784	**0.872**				
PITM	0.701	0.860	0.775	0.480	0.712	0.322	0.543	0.632	0.621	0.576	0.603	0.693	**0.880**			
SEVI	0.739	0.891	0.715	0.542	0.805	0.375	0.524	0.659	0.736	0.669	0.612	0.655	0.598	**0.846**		
PKG	0.737	0.716	0.897	0.834	0.682	0.770	0.160	0.174	0.357	0.397	0.325	0.399	0.242	0.312	**0.947**	
PPC	0.755	0.897	0.863	0.834	0.760	0.741	0.214	0.220	0.379	0.354	0.323	0.320	0.281	0.347	0.913	**0.929**

Source: Fieldwork Data (2023)

The researchers tested the hypothesized structural model by applying the various model fit indices, including the absolute, incremental (relative/comparative), and parsimony fit indices as recommended by scholars like (Thakkar, 2020). After carrying out modifications to improve on the model fit, by removing indicators with high modification indices (MI) (Hair et al., 2019), the model fit indices are presented in Table 7.

Table 7: Model Fit Indices for Structural Model

Fit Indices	**Cutoff value**	**Model value**
Absolute Fit Indices		
χ^2 (Chi-square)		3664.123
df (Degrees of Freedom)		1938
χ^2/df	<2.0	1.8907
GFI	>0.90	0.956
AGFI	>0.80	0.838
RMSEA	<0.08	0.054
Incremental/ Relative Fit Indices		
Normed Fit Index (NFI)	>0.80	0.817
Comparative Fit Index (CFI)	>0.90	0.981
Incremental Fit Index (IFI)	>0.90	0.983
Relative Fit Index (RFI)	>0.90	0.902
Parsimonious Fit Indices		
Parsimony Goodness of Fit Index (PGFI)	>0.90	0.932
Parsimonious Normed Fit Index (PNFI)	>0.90	0.932

Source: Fieldwork Data (2023)

The final hypothesized models for examination are presented in Figures 2 and 3.

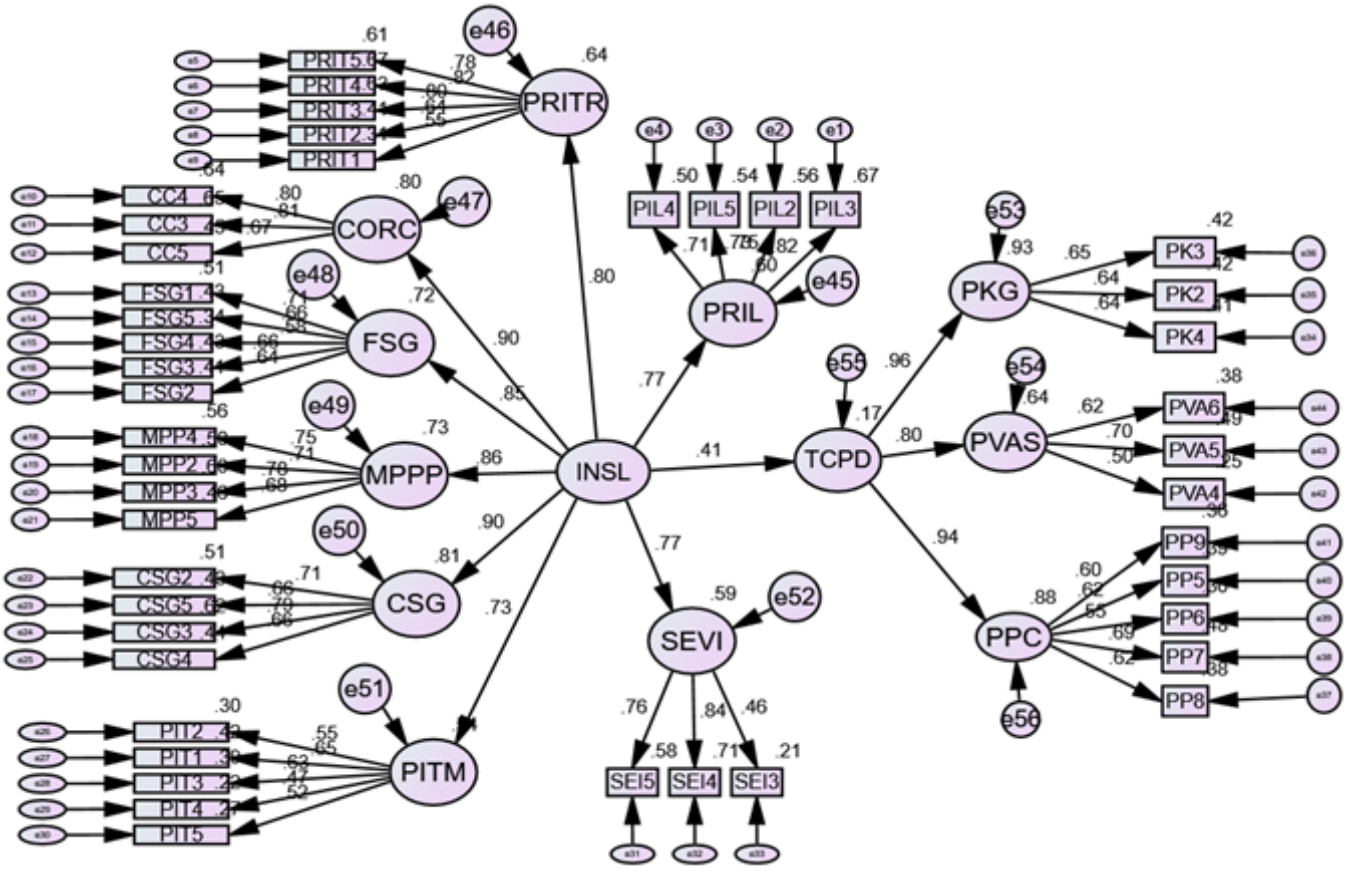

Figure 2: Hypothesized Model

Source: Fieldwork Data (2023)

Note: INSL (Instructional leadership); TCPD (Teacher continuous professional development); PRIL (providing incentives for learners); PRITR (providing incentives for teachers); CORC (coordinating school curriculum); FSG (framing school goals); MPPP (monitoring learners' progress); CSC (communicating school goals); PITM (protecting instructional time); SEIV (supervising and evaluating instruction); PVA (professional values and attitudes); PKG (Professional knowledge); PPC (Professional practice)

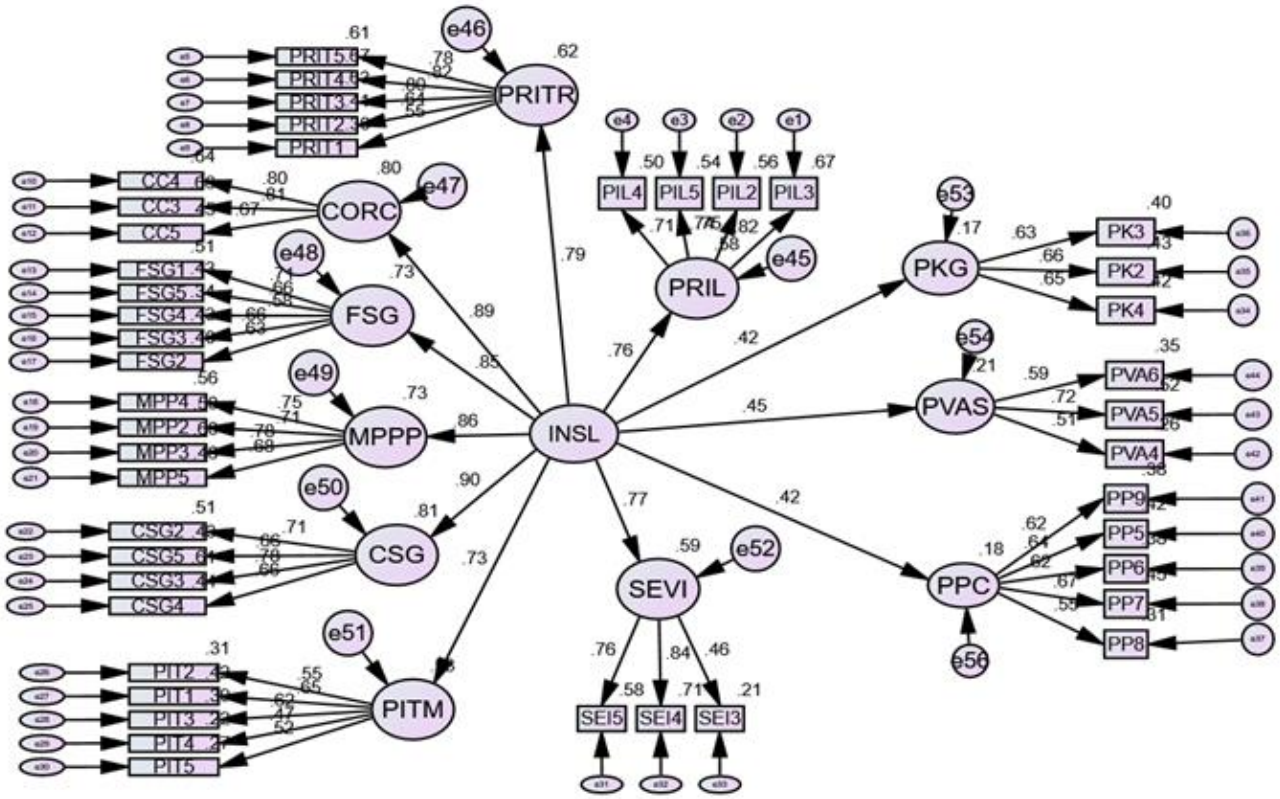

Figure 2: Hypothesized Model

Source: Fieldwork Data (2023)

FINDINGS AND DISCUSSION

The findings from the analysis of data are presented in Table 8.

Table 8: Path Coefficients of Instructional Leadership Predicting Continuous Professional Development

	Path		Estimate	S.E.	C.R.	P	Label
TCPD	<---	INSL	0.413	0.028	8.314	0.000	Significant
PKG	<---	INSL	0.417	0.031	7.966	0.000	Significant
PVAS	<---	INSL	0.454	0.026	7.535	0.000	Significant
PPC	<---	INSL	0.422	0.028	8.043	0.000	Significant

Source: Fieldwork Data (2023)

The path analysis revealed that instructional leadership contributed 41.3% to teacher continuous professional development which was statistically significant (β=0.413, S.E=0.028, C.R=8.314, $p<0.05$). This finding implies that, instructional leadership is a vital determinant of teacher continuous professional development in Ghanaian public basic schools. Further scrutiny of the path coefficients established that instructional leadership contributed significantly to all the indicators of teacher continuous professional development in the model. For instance, instructional leadership contributed statistically significant 41.7% to teacher

knowledge (β=0.417, S.E=0.031, C.R=7.966, p<0.05), 45.4% to teacher professional values and attitudes (β=0.454, S.E=0.026, C.R=7.535, p<0.05), and 42.2% to teacher professional practice (β=0.422, S.E=0.028, C.R=8.043, p<0.05) respectively.

This finding resonates with Agyeman-Nyarko and Dzakadzie's (2021) findings in the Colleges of Education in Ghana where it was established that instructional leadership contributed significantly to the continuous professional development of the tutors (β=0.137, t=3.297, p=0.001). Likewise, the finding agrees with the findings of Hosseingholizadeh et al. (2020) in Iran (Asia) which showed that instructional leadership significantly affected the teachers' continuous professional development (β=0.41, p<0.001). The consensus among these researchers suggests that the continuous professional development of teachers would improve if headteachers prioritise and practice instructional leadership effectively in schools.

The role of the headteacher in promoting the continuous professional development of teachers is well documented. Despite efforts to ensure teacher professional autonomy where teachers take charge of their continuous professional development as espoused in Kennedy's (2005) model and supported by other theorists (Atiku, 2022; Mesa & Pringle, 2019), the role of the school head in promoting teacher continuous professional development cannot be discounted. For instance, Gyamerah (2021) argues that efforts of the school head in enhancing and sustaining the continuous professional development of teachers is one of the principal mandates and obligations in school leadership and administration. In an empirical study in rural districts in Ghana, Gyamerah (2021) disclosed that headteachers as instructional leaders facilitate the organization of continuous professional development programmes for their teachers with the aim of improving their instructional practices. Ismail et al. (2018) further explicate that, headteachers influence teachers' instructional activities by creating a conducive school climate that support learning among students.

The significant effect of instructional leadership on the continuous professional development of the teachers is not surprising because scholars note that instructional leadership primarily focuses on curricular and instructional activities that are directly linked to teacher improvement (Ibrahim, 2020; Khan et al., 2020). This observation suggests that, teachers are the prime recipients of headteachers' instructional leadership practices. This situation arises in the Ghanaian basic education context where headteachers do not double as class teachers, hence they are not directly involved in actual classroom instruction. Therefore, the headteachers tailor their instructional leadership efforts directly to their teachers to improve their teaching and learning practices in the classroom. Therefore, it is expected that the continuous professional development of the teachers will be augmented through the headteachers' instructional leadership practices. The findings of this study are consistent with the findings of Ismail et al. (2018) in Malaysia which showed that instructional leadership contributed a significant 16% and 12% to teachers' professional knowledge and professional values and attitudes respectively. These findings suggest that the effective practice of instructional leadership among headteachers enhances the various indicators of teachers' continuous professional development.

CONCLUSIONS AND RECOMMENDATIONS

The study concluded that the headteachers played a central role in promoting the continuous professional development of their teachers through their instructional leadership practices. The study provided evidence to conclude to instructional leadership practices of the headteachers were good predictors of continuous professional development among the teachers. This implies that the headteachers performed their instructional leadership functions that enhanced the professional knowledge, practices, and values and attitudes of teachers which are essential to enhance the quality of teachers as well as their instructional practices. Consistent with this finding, the researchers argue that one strategy to advance the continuous professional development of the teachers is to encourage and support the headteachers to practice their instructional leadership roles effectively in the schools. In line with the finding that instructional leadership of the headteachers significantly predicted the continuous professional development of the teachers, the

researchers recommended that headteachers should be supported and oriented to intensify their instructional leadership practices in so as to enhance the continuous professional development of teachers in public basic schools in Ghana.

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Statements and Declarations

Not applicable

Declaration of Conflicting Interests

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