

## Long-serving primary teachers' motivation and perception for teaching in Kumasi, Ghana

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### ABSTRACT

This study explores the motivations and perceptions of long-serving primary school teachers in Kumasi, Ghana. Using Herzberg's motivation-hygiene theory and qualitative interviews with 30 teachers with over ten years of service, the study examined factors influencing teacher retention and intentions to leave. Findings reveal that intrinsic and altruistic motivations—particularly student success, self-identity as a teacher, and social contributions—sustain long-term commitment, while inadequate compensation, poor working conditions, and low societal regard act as major demotivators. The study extends Herzberg's model by integrating altruistic motivation as a critical retention factor. These findings highlight the need for holistic teacher-retention policies that address both material and psychological conditions of teaching.

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## 1. INTRODUCTION

The United Nations Educational, Scientific, and Cultural Organization (UNESCO) reports that a global shortage of teachers is expected by 2030, especially in Africa, North America, Europe, Latin America, and the Caribbean, with a projected shortfall of 44 million teachers [1]. Some studies have extensively examined teacher attrition by claiming that understanding the reasons why teachers are leaving the profession will serve as a guide for developing more effective retention strategies [2]. Considering this, most studies focus on early-career teachers' attrition, who are often seen as more likely to change jobs [3]. In contrast to this issue, recent trends show that experienced/long-serving teachers are also living more often particularly in the Western world [4]. Most research on long-serving teachers originates from English speaking countries such as the United States, Australia, England, with only one comparative study from non-English speaking countries (Jamaica, Poland, and Turkey) [4]. For instance, Plauborg and Petersen [4] examined the retention of long-serving teachers from a posthuman perspective, conducting a scoping review of 288 articles. However, only 12 studies published from 2008 to 2023 specifically addressed the retention of long-serving teachers. Although there is extensive research on teacher motivation and attrition, there is little data on long-serving primary school teachers in Sub-Saharan Africa [5]. Thus, the focus comes from concerns raised by Ghanaian teacher unions, such as the Ghana National Association of Teachers (GNAT), the National Association of Graduate Teachers (NAGRAT), and the Coalition of Concerned Teachers (CCT), about poor working conditions, unpaid benefits, low salaries, and slow promotions [6]. As a result, these concerns show the urgent need to improve teacher satisfaction and retention. This demonstrates that teacher retention is a major research topic, as many governments struggle to retain teachers in the profession. Because of this teacher retention is a key issue for policymakers, civil society, non-governmental organizations, and

researchers [7]. In Ghana, most studies focus on the general teacher population, leaving the motivations of veteran teachers poorly understood [8], [9]. This study seeks to address this gap by examining the factors that motivate or discourage long-serving primary teachers in Kumasi to remain in or consider leaving their positions in the future. Therefore, investigating long-serving teachers is anticipated to provide more nuanced insights into the motivations for remaining in or, where relevant, leaving the teaching profession in a developing country context.

Teacher motivation is diverse, complex, and varies between countries. The motivation to teach may also fluctuate over time due to socio-economic, political, and cultural influences. As a result, a person's ability to teach can be influenced by both positive and negative reinforcement, which may affect one's job satisfaction or dissatisfaction [10]. Given these complexities, motivation has been extensively examined in education and psychology as a driving force that directs individuals to perform specific tasks [11]. Because motivation is contextual and can change over time, many researchers use a two-dimensional model to encompass character, direction, and the intensity of human behavior. These authors further emphasise that motivation can explain how an activity is performed, the duration of engagement, and the level of effort involved. According to Dörnyei and Ushioda [11], motivation can be classified into three types: intrinsic, extrinsic, and altruistic.

In the teaching profession, intrinsic rewards include the enjoyment of teaching others, interest in the subject, and satisfaction in watching students learn [12]. This author noted that teachers' intrinsic motivation stems from the satisfaction derived from the teaching process and the value they place on teaching practice. Therefore, intrinsic work motivation is necessary because it may help teachers manage the stress they endure and maintain a realistic attitude towards their prospective social rank and wages. Thus, for this study, intrinsic motivation is the deep passion an individual shows for a particular task.

In Africa, for example, a study in Côte d'Ivoire found that primary school teachers chose teaching because they wanted to be creative in helping children discover solutions to everyday problems [13]. In Ghana, research has also mentioned intrinsic reasons for why people chose teaching as a vocation [14]. However, these studies have largely focused only on general teacher motivation and have not specifically investigated motivation and commitment differ among early-career, mid-career, and long-serving teachers in Ghana. Thus, understanding these categories of teachers' careers and their motivation levels can inform policy and workforce development.

Extrinsic motivations in teaching include pay, job security, workload, promotions, and demotions [15]. Similarly, employees are inspired to increase productivity when extrinsic and intrinsic motivation elements are effectively combined [16]. In Africa, studies in Nigeria [17], Kenya [18], and Ghana [19] identified financial rewards as key influences on teachers' decisions to enter and remain in the teaching profession. These studies identified compensation, job characteristics, and the teaching environment as primary external drivers influencing teachers' decisions to enter, remain in, or consider leaving the profession. Collectively, these findings indicate that some individuals choose teaching primarily for extrinsic reasons. However, these studies as stated earlier did not concentrate on long-serving primary school teachers and instead addressed general teacher motivation in Ghana. In this context, extrinsic motivation is defined as the tangible and intangible rewards individuals receive for successfully completing a task, as well as the punishments imposed for failing to meet organizational or institutional expectations. It is therefore essential to identify and better understand the role and contribution of extrinsic factors in shaping teachers' policies and incentives.

According to Li and Guo [20], altruistic motivation involves valuing teaching as a noble endeavour, supporting the betterment of society, youth, and individuals within the teacher's interacting environment. This implies that a well-motivated teacher goes the extra mile to inspire students to love learning and guide them in their holistic development. Therefore, in our opinion, teachers see themselves as having a calling because they aim to make a difference in children's lives, especially those from underprivileged backgrounds. The interest in working with children stems from compassion, which is an example of altruistic elements. Thus, teachers recognise that education can positively influence a person's life in ways that might otherwise be unattainable. In the teaching profession, self-interest includes the passion to transform students' lives, contributing to societal progress by addressing social injustices through teaching [21]. Furthermore, according to Perryman and Calvert [22], factors such as low wages, greater workload compared to other professions, and low social status can make teaching seem undesirable, possibly leading to job dissatisfaction. Nonetheless, the teaching profession remains meaningful and noble because of its contribution to societal welfare, emphasising service to humanity. Social interactions influence the motivation of both students and teachers, where the social relatedness of teachers can affect their job satisfaction and willingness to continue teaching. We therefore define altruistic motivation as a selfless devotion to humanity.

Considering this, we suggest that intrinsic, extrinsic, and altruistic motivations can sometimes overlap because the three play a key role in sustaining teachers' interest in the teaching profession. Specifically, we refer to this intersection as teacher motivation as shown in Figure 1.



Figure 1. Teacher motivation-overlap of extrinsic, intrinsic, and altruistic motivation (source: authors' construction)

## 2. LONG-SERVING TEACHERS

Long-serving primary school teachers are essential to supporting children's education [23]. Experienced teachers possess diverse classroom experiences, such as lesson planning, classroom management, addressing inadequate pay, and seeking professional recognition, illustrating the complexity and demands of primary education [24], [25]. The term long-serving teacher lacks a universally accepted definition, and terms such as veteran, experienced, and long-serving are often used interchangeably [26]. Several efforts have been made to clarify this concept. For example, Chiong *et al.* [27] summarised definitions from McIntyre [28], who described long-serving teachers as those with more than twenty years of teaching experience. According to Day and Gu [29], veteran teachers are those in their third and fourth decades of teaching, while Chiong *et al.* [27] defined veteran teachers as those with over 10-15 years of service. For this study, the definition provided by Plauborg and Petersen [4] is adopted, characterising a "Long-serving teacher as one with 10 years or more of teaching experience". Therefore, this study examines teachers with at least 10 years in the profession. In recent years, research on teacher retention has increased significantly (see, for example, [25], [30], [31]). Much of this literature focuses on teacher attrition among early-career teachers [32], while other studies provide only general accounts of attrition without specifying years of experience in Ghana [5]. Also, other research in Ghana, such as Adarkwah [9], focused on only senior high schools by assessing teachers' motivation during the COVID-19 pandemic in Kumasi. In this context, the conditions of service at all levels of education may differ. Consequently, there is limited understanding of the inspirations or challenges long-serving teachers face and the factors that sustain their long-term commitment to teaching [4].

### 2.1. Theoretical framing

This study is guided by Herzberg *et al.*'s [33] motivation-hygiene theory (MHT), which serves as the conceptual framework. Herzberg and colleagues delineate two categories of factors influencing motivation: motivator factors, which are intrinsic to the job and enhance work satisfaction, and hygiene factors, which are extrinsic conditions that, when inadequate, result in job dissatisfaction. The theory provides a nuanced understanding of teacher motivation by differentiating intrinsic motivators (e.g., achievement, and recognition) from extrinsic hygiene factors (e.g., salary, working conditions). This bifurcation aligns with the dual objectives of the present research, namely, to explore the factors that encourage teachers to remain in the profession and those that may lead them to contemplate departure.

Recognising the limitations of the original MHT in fully capturing the motivational complexities of teachers within the Ghanaian context, this study extends the framework by incorporating altruistic motivation as an additional, salient driver as shown in Figure 2. This modification reflects the moral and societal commitments frequently articulated by teachers, particularly their aspiration to positively impact students' lives and contribute to broader social transformation. By integrating altruistic motivation, the adapted model offers a more comprehensive representation of the lived experiences and motivational dynamics of long-serving educators. It was through the combination of these three motivational categories that informed both the construction of the interview guide and the initial coding framework during the thematic analysis.



Figure 2. Incorporating altruistic motivation into Herzberg's MHT (source: authors' construction)

### 3. METHOD

#### 3.1. Research design

This study employed a qualitative methodology focusing on phenomenological approach within a broader mixed-methods design [34], to capture teachers' perspectives on teaching in primary schools in the Kumasi Metropolitan Area (KMA). Thus, phenomenology is defined by Williams [35] as a "Study of that which can be experienced". The main reason for adopting this approach is to gain insight into the realities of long-serving primary school teachers' inspirations as well as demotivation, if any, in their career trajectory.

#### 3.2. Participants and data collection

The study used the purposive sampling method to recruit participants. The sample in this study consisted of 30 participants (19 females and 11 males). Interview participants were drawn from a larger sample of 260 participants who had participated in survey research that sought to investigate primary school teachers' motivation and perceptions of teaching in the KMA, Ghana [34]. The criteria for selecting these thirty participants included having at least ten years of teaching experience. From a pool of 260 participants from the survey, a request was made to seek participants who were willing to engage in semi-structured interviews. We identified sixty-one prospective participants from the survey. As stated, we wanted long-serving teachers who had taught for a decade or more; therefore, we selected the teacher from each of the participating schools with the most teaching experience. We chose thirty teachers from the thirty primary schools so we could have a representative sample for the interviews. The data collected was enough to determine the patterns and themes within the data set. To ensure that participants and schools were protected, steps were taken to protect the anonymity of the participants, and the names of the schools were pseudonymised.

All participants were full-time teachers at thirty different state/public primary schools who consented to in-person interviews, with detailed field notes recorded during the sessions. The study's participants are presented in Table 1.

#### 3.3. Interview guide

A semi-structured interview guide was used because it allows for flexibility in questioning interviewees, thereby enabling the collection of relevant data during the interview [35]. The guide was crafted using specific research questions as a framework, with sub-questions derived from the larger study's main research question to explore the central themes further [34]. The questions were constructed around Herzberg's model and the three motivation types. The interviews were conducted face-to-face by the first author between September 2 and December 18, 2024. Face-to-face interviews were selected as they permit direct interaction between the interviewer and participants, promoting a more personal and in-depth discussion [35]. The interviews took place in each participant's respective school during break times, and others were interviewed at home. Each interview lasted no longer than 45 minutes, and all proceedings were recorded in a field notebook with the participants' consent. During the interview process, observer reliability was maintained by conducting interviews and recording detailed field notes [35]. Personal interviews enabled

us to gain insights into individual motives and perceptions. Member checks and triangulation strengthened the trustworthiness of the findings. Participants were provided with preliminary analyses for validation, data from field notes, and interviews were cross-checked to ensure reliability. Consequently, this study only used their verified comments or participant-approved statements that matched what was recorded in the field notes, what they intended to convey, and what they truly meant. This approach is supported by Creswell and Creswell [36], who emphasised that obtaining participants' approval to use their opinions or comments is crucial for good research practice. Participants were allowed to read and make any changes to conversations recorded in the field notes. This process helped to minimise analyst subjectivity and enhance the validity of the findings.

Table 1. Demographic profile of the 30 participants

	Pseudonym	Gender	Years in service
10-19 years' experience			
1.	Abdul	M	11
2.	Ayana	M	19
3.	Basoah	M	14
4.	Boateng	M	18
5.	Kofi	M	15
6.	Kojo	M	19
7.	Kumi	M	17
8.	Seyram	M	18
9.	Achiaa	F	13
10.	Afia	F	16
11.	Akos	F	15
12.	Aku	F	11
13.	Akua	F	10
14.	Ataa	F	14
15.	Azumah	F	12
16.	Amina	F	10
17.	Durowaa	F	10
18.	Kisiwaa	F	13
19.	Owusuaa	F	13
20.	Zenaibu	F	14
Above 20 years' experience			
1.	Agamate	M	27
2.	Boakye	M	23
3.	Kwame	M	25
4.	Adwoa	F	21
5.	Akete	F	27
6.	Ama	F	25
7.	Antwiwaa	F	23
8.	Ekua	F	20
9.	Kyerewaa	F	20
10.	Twenewaa	F	26

### 3.4. Data analysis

We analysed the open-ended questions using detailed field notes. Examples of the questions were "How long have you been teaching in a primary school?" "As a teacher, how have you influenced your students' lives?" and "In what ways have your experiences in teaching benefited society?" "How would you describe the way the public views teachers?" "What impact does compensation have on you as a teacher?" This approach helped group qualitative data around key concepts [36]. The primary aim was to classify participants' perceptions based on their daily inspirations and challenges as primary school teachers through the theory-driven lens of Herzberg's MHT. We analysed by repeatedly reading through the entire set of themes in the field notes recorded during the interviews to gain an in-depth understanding of teachers' self-reflections on their profession. Responses that were similar or different were grouped for clarity.

To enhance the dependability of the results, triangulation was employed. We reviewed the data multiple times to ensure consistency and clarity. Major themes/salient points were compared and discussed thoroughly to minimise researcher bias and uphold the integrity of the findings. The analysis was ongoing, involving multiple readings by highlighting thematic areas, which helped verify our interpretations. As this study used field notes, these were returned to the participants to verify that what was recorded was what they meant and intended to be reported. Any changes made by the participants were accepted. As such, this paper includes the participants' authenticated comments to voice their experiences and strengthen the trustworthiness of the findings.

#### 4. RESULTS AND DISCUSSION

In line with the research questions: i) What factors influence long-serving primary school teachers to stay in the profession? and ii) What demotivating factors contribute to teachers' plans to leave teaching in the future? The results revealed teachers' perceptions of factors that encourage continued teaching (motivators) and extrinsic (hygiene factors) affecting their work. These were categorised into themes and sub-themes based on the study's field notes. Firstly, we present findings related to motivators, factors that sustain teachers' commitment and satisfaction in the profession. Secondly, we examine hygiene factors, demotivators that limit or threaten long-term engagement. Each thematic section begins by concentrating on the issue within the wider literature, followed by a presentation of relevant participant comments, and ends by linking these findings to the broader research questions. Instead of treating participant data merely as examples, we use their authenticated comments as central to developing the subsequent arguments. Drawing on MHT, we interpret how experienced teachers in this study navigate between intrinsic and altruistic motivators and extrinsic hygiene factors in their daily professional lives. The following themes illustrate how these elements influence their sense of purpose, job satisfaction, and long-term commitment to primary school teaching. As stated, this data derives from a larger research project, and therefore, the most dominant themes have been chosen for this paper. The themes and sub-themes identified from the participants' field notes are presented in Table 2.

Table 2. Themes and sub-themes of field notes from long-serving teachers in primary schools

Theme	Sub theme
Theme 1: motivation to stay in the teaching profession	Self-perception as a teacher Inspire students to love learning Student achievement Recognition
Theme 2: demotivating factors influencing teachers' work in primary schools	Community perspectives on teachers' work Working conditions of schools Inadequate compensation

The themes identified in our study illustrate the complexity of teachers' motivations and challenges. Each interview provides insight into how participants perceive their work environments, which are shaped by specific circumstances. The timing and location of the interviews may have influenced participants' responses, particularly in relation to ongoing events. Our data collection coincided with the 2024 general elections, a period marked by significant political tension between the main parties. This environment may have led some participants to be more reserved in expressing their true perspectives. We do not claim to represent the teachers' voices; rather, we incorporate their direct comments to provide depth to our analysis. Although we sought to foreground their perspectives, our interpretations should be considered within the contextual limitations of this study.

##### 4.1. Theme 1: motivation to stay in the teaching profession

###### 4.1.1. Self-perception as a teacher

The long-serving teachers described their enjoyment of the profession, identifying intrinsic, and altruistic motivations as primary factors for remaining in teaching. They expressed confidence in their abilities and demonstrated a commitment to shaping students' lives by fostering critical thinking and problem-solving skills. Participants conveyed assurance in their professional expertise. Several recounted examples of former students who have become teachers, police officers or are currently pursuing university studies, illustrating the potential rewards of a teaching career. As Ama stated, "*I'm always confident because my efforts speak for what I do as a teacher.*" Kwame noted, "*I take a sober reflection after every lesson I teach, and this always guided me to improve my practice. I'm positive about what I teach my students.*" Ayana also shared this, "*I belief in myself and what I can do. I'm a competent teacher.*"

Teaching is characterised as an inspiring profession influenced by personal motivation, individual teaching philosophy, and systemic challenges [15], [37]. Teachers not only impart knowledge but also serve as role models, facilitate the development of critical skills, inspire curiosity, and support students in achieving their potential [24]. Majority of the teachers in this study demonstrated a positive image about themselves and this has helped them to discharge their duties effectively. As Kojo stated, "*Self-belief is my source of motivation.*" Kojo indicated that forming a positive image about himself gives him the joy to carry out his responsibilities as a teacher. According to Herzberg and colleagues [32], achievement involves satisfaction derived from completing meaningful and challenging tasks and observing positive outcomes, such as students' successes. Such intrinsic motivation contributes to the development of self-efficacy among the teachers in this study. However, Herzberg's theory cautions school leaders to appreciate the effort of employees by creating a conducive environment for teachers to thrive and improve their practice.

#### 4.1.2. Inspire students to love learning

The participants in this study emphasised that fostering curiosity and cultivating a passion for learning are central to their teaching philosophy. They mentioned both personal commitment and altruistic values to instil a love of learning in every student. Several participants spoke about strategies they employed to influence students to love learning, especially mathematics and science that seem difficult for students. Akete said, *“I use variety of motivation and activity-based techniques to make my lessons interesting especially mathematics, I give both tangible and non-tangible rewards to make my class attentive.”* Boakye noted that teachers seek to *“Inspire children to love learning,”* a sentiment echoed by other participants, who highlighted the significance of modelling trustworthiness, honesty, adaptability, and dignity in classroom leadership. Ayana agreed, stating, *“Their mission is to awaken an interest in learning in every child they teach.”* Participants in this study expressed that they strive to create a second home for students to learn and grow.

#### 4.1.3. Student achievement

The teachers in this study were primarily enthused by students' achievement. Witnessing students' academic and personal success gave them a sense of purpose and fulfilment. Some participants were very proud to see their students excel in academia and other aspects of life. All participants emphasised this motivation. For example, Aku stated, *“Teaching can be creative, engaging, and relevant when the students we teach excel in their academics.”* Many teachers expressed enthusiasm when they saw their students succeed, even in challenging environments [24]. Some participants were excited that some of their students wanted to be teachers in the future. Aku said, *“I was so happy that three of my students came and said they would like to become like me. I was so thrilled to hear this because after we left, there should be continuity.”* Ama also recounted, *“I felt joy when my former student said, ‘Madam, thank you for helping me love reading.’”* These aligns with findings from Ampong [6], which indicate that teachers are inspired by their students' successes and remain committed to the profession even in the face of adversities. This shows that most participants continue to teach because they want to make a difference in students' lives.

#### 4.1.4. Recognition

Participants expressed varied perspectives regarding public perceptions of teachers. Seven participants concurred with Adarkwah [9], who stated that passion, the feeling of responsibility, and the desire to contribute to society and foster student development made them resilient towards the deleterious effects of the pandemic to promote optimal teaching. Achiaa observed, *“Many people now understand well how essential teachers are, especially at times of crises like the COVID-19 pandemic.”* Similarly, Akua remarked, *“People respect the profession now, and they know its value because it has been a hard time, like the pandemic.”*

Recognition of employees' efforts can enhance their sense of connection to their organization and can increase productivity. Although misconceptions and ambivalent attitudes toward teachers persist, public perception of the teaching profession is gradually improving. Public awareness of the critical role of teachers increased during the pandemic, particularly as teachers adapted instruction for remote learning. This shift reflects a broader societal change, with greater recognition of teachers' contributions beyond the classroom, as noted by several participants. Thus, these concerns from participants resonate with the Gibson [24], who suggested that teacher appreciation week and related community support program can boost teachers' efforts and recognition. These initiatives have contributed to correcting misconceptions about the teaching profession and fostering a more supportive environment for teachers. The intrinsic and altruistic factors that have influenced participants' tenure are contradicted with a study Day and Gu [29] who found that teachers are economically vulnerable particularly in areas where teaching as a profession is undervalued. These have a serious repercussion if systemic factors such as recognition, advancement, and achievement noted by Herzberg are not addressed.

#### 4.1.5. Summary

Significantly, these long-serving teachers described both their enjoyment in teaching and how they saw teaching as an inspiring profession. This positivity was reflected in their comments on being able to enthuse their students as well as instilling a love of learning in their students. While public perception of teachers is improving, these teachers noted the importance of having their efforts recognized by their school. These findings reinforce Herzberg's motivator construct, where recognition and personal achievement strengthen occupational commitment.

### 4.2. Theme 2: demotivating factors influencing teachers' work in primary schools

#### 4.2.1. Community perspectives on teachers' work

Many participants lamented that people think teaching in primary school is an 'easy task' that does not need much skill or dedication. A parent once told Akos, *“As for primary school teaching, she can equally*

teach.” Afia shared that a parent made a discouraging comment at a parent-teacher meeting, “*Teachers in her school do not teach, that is why her class four daughter could not identify a three-letter word.*” For example, Kumi said, “*People don’t always see how much goes into planning and managing a classroom.*” Boakye said, “*They don’t see the hours of preparation or emotional energy involved. The nature of teachers’ work is misunderstood by many people.*” Abdul added, “*There are still misunderstandings of what teachers face, especially the mental and emotional labor.*” Respect from society helps keep teachers motivated, as Akete said, “*It is nice to be valued.*”

These negative perceptions hide the real effort teachers make and often lead to them being blamed when students do not excel in their studies, even though teachers face many challenges. These lamentations from the participants are in line with Ampong [6] who note that when school leaders and the community do not recognise teachers’ efforts, teachers may feel unhappy, become uncommitted, and may consider leaving the profession. Many participants shared that the public does not understand how demanding teaching is. Teaching is much more than just giving lessons. It requires careful planning, assessment, monitoring, emotional support, and flexibility. Participants agreed with this. However, in many places, such as Ghana, teachers are not seen as equal to other professionals, such as nurses, engineers, lawyers or doctors. This aligns with what [30], [38] found, saying that a lack of respect can stop people from becoming teachers or staying in the teaching profession. However, Boateng had this to say, “*Many parents see teaching beyond the context of imparting knowledge but see teachers as role models. They expect teachers to hold high moral values. Some parents even expected us to be like saints.*” When asked if society sees teachers as professionals like doctors, lawyers, or engineers, all participants said they did not think so. Some of these perceived disregards of the teaching profession by some members in society can potentially hurt teachers’ morale and may lead to attrition.

#### 4.2.2. The working conditions in primary schools

Interactions with long-serving teachers revealed that working conditions in primary schools posed a challenge to perform their tasks effectively. Ama noted:

*“When I was posted to this school eight years ago, I felt like weeping. The entire school building was dirty, with cracks everywhere, and there were no proper, convenient facilities for teachers and students. It was horrible, you know... an urban school indeed. I was devastated.”*

Ama recalled arriving eight years prior to finding the school building cracked, dirty, and lacking adequate facilities for both staff and students. The poor condition of this urban school left her devastated. Working conditions in Ghanaian primary schools directly influence teachers’ intentions to leave. Most Ghanaian teachers face significant challenges, including overcrowded classrooms and insufficient time and resources to plan lessons tailored to students’ needs. Twenty-seven from thirty participants expressed dissatisfaction with their working conditions. Amina also cited the poor state of the school, emphasising inadequate infrastructure as a primary reason for her dissatisfaction. These challenges are prevalent among teachers and students, even in urban settings where this study was conducted. This finding aligns with research in similar contexts, which identifies inadequate infrastructure and insufficient resources as persistent barriers to teacher retention [3]. Studies in other West African countries have also found that lack of support and poor working conditions contribute to high teacher attrition [17]. Seven participants (Kofi, Kojo, Akua, Afia, Zenaibu, Amina, and Basoah) expressed similar concerns as mentioned above as hampering their work. For example, Kofi gives a representative statement:

*“The dilapidated infrastructure and inadequate classroom spaces affect teaching and learning, even though the school is in the city center. Most of the dual desks are wobbly, making it hard for students to sit comfortably. The officials promised to bring new ones, but...”*

Kofi described how dilapidated infrastructure and insufficient classroom space hinder teaching in this city-center school. Most of the furniture makes it difficult for students to sit comfortably, despite officials’ promises of replacements. Participants’ concerns about their work environment are consistent with [8], which found that current teaching conditions are characterised by limited physical resources, large class sizes, and excessive workloads, all of which significantly affect teachers. Participants also emphasised inadequate systemic support. Owusuaa remarked, “*We were not involved in the planning and drafting of the new curriculum; we were only invited for workshops on the new curriculum and were taught how to implement it in the classroom. That’s frustrating...*” These participants shared those insufficient resources to support their participation in professional development workshops has a profound impact on their work. Similar challenges were observed in the new curriculum in Ghana.

### 4.2.3. Inadequate compensation

Non sustainable salaries and incentives were mentioned as the main barriers to teachers' job satisfaction. Participants noted that, given the absence or scarcity of high salaries and benefits in most jobs in Ghana, there are also limited lucrative opportunities for those wishing to switch careers. While most teachers choose teaching driven by passion, financial rewards often fall short in retaining them. MHT emphasised that salary, as a hygiene factor, can cause job dissatisfaction if institutions fail to reward their staff adequately. Participants' lamentation in this study concurred with Boateng [5] who suggested that fair pay is what keeps teachers motivated, especially in a developing country like Ghana, where individuals are valued based on the wealth, money, or resources they hold. As all the participants mentioned this idea, it was best expressed by Ataa:

*"It's vital to feel fairly rewarded for your work. It's disheartening because salaries are not proportional to the effort we put in as teachers. The amount we receive as a monthly wage is painfully inadequate given the high cost of living."*

In contexts where teaching is financially unattractive, compensation can indeed have a remarkable effect. However, compensation may not entirely sustain teachers' interest in the profession because many factors play a key role in keeping teachers in their positions.

### 4.2.4. Summary

The themes were mainly motivators and hygiene factors, as noted by MHT. Teachers remained resolute in their profession because of a strong sense of vocation. Most participants stated that they become overjoyed when they see the success of their students excelling in other professions and the field of academia. Some also cited the appreciation from parents and the community they work in as a major inspiration to them. On the other hand, the hygiene or extrinsic factors that bring about job unhappiness among these long-serving teachers were poor compensation, workload, and community perceptions impeding teachers' motivations. Thus, the findings of this study are in sharp contrast with Salifu and Odame [14] study in Ghana who found that pre-tertiary teachers in Accra, Ghana were inspired to remain teaching because of they wanted to contribute to the development of the community. These findings reinforce Herzberg's hygiene construct, where working conditions and inadequate compensation weaken occupational commitment.

### 4.3. Implications

These findings hold significant implications for Ghana's education system. The study indicates that enhancing teacher engagement and retention can strengthen educational policies. Implementing a teacher incentive strategy grounded in the Herzberg motivation-hygiene model, analogous to inclusive education may help direct resources toward retaining teachers. The research further advocates for incorporating an altruistic dimension into Herzberg's model, which could be particularly beneficial in primary schools. Providing equitable wages can enhance the public perception of teaching and encourage retention. Supplying teaching aids, modern facilities, and maintaining manageable class sizes would address prevalent teacher concerns.

Theoretically, this study has contributed to long-serving teachers' motivation and perceptions of teaching and how these impact their work and professional lives. However, there is a dearth of research on this topic in developing countries such as Ghana. Thus, the current study has therefore contributed to this gap in the literature on teacher motivation by identifying the potential factors that have influenced long-serving teachers' decision to continue teaching in a developing country context.

The study also contributes to the findings of Herzberg's MHT. Herzberg *et al.* [33], were of the view that hygiene factors are referred to as extrinsic elements, should supplement the motivators (intrinsic elements) to provide a conducive environment for employees to thrive and increase productivity. The study gives credence to both intrinsic and extrinsic elements as crucial in promoting teachers' motivation and job satisfaction. Whereas the absence of these factors or one of them can cause unhappiness in the workplace, leading to attrition. Thus, this study aimed to contribute to new knowledge by suggesting the inclusion of an altruistic component to the Herzberg two-factor theory that makes its applicability broad.

In addition, this study's findings are academically and practically relevant. Beyond crisis management, they provide the framework for policies that will raise Ghana's teaching profession and ensure its survival. Policies in Kumasi and the Ashanti Region may assist in stabilising the teaching profession, increasing student performance, and fostering a more resilient and engaged teacher community to promote national progress by understanding and addressing these findings from this study. The education sector should also prioritise increasing respect and recognition for teachers through awards, public acknowledgment, and transparent promotion pathways to underscore the value of their contributions. Monthly awards for dedicated and innovative teachers could further elevate the profession's image.

The study recommends granting regions greater autonomy in policy development. For instance, Kumasi's combination of urban and peri-urban areas demonstrates the necessity for differentiated approaches. Given the disparities in wealth and geography across Ghana's districts, these factors should inform the design of improvements and incentives. Teachers in urban areas of Kumasi may benefit from access to classroom technology or materials, while those in peri-urban regions could receive support in housing, transportation, or school development. Aligning incentives with teachers' experiences can enhance job satisfaction and retention.

Insights from experienced teachers elucidate the factors that sustain motivation during challenging periods and can inform more targeted policies for basic education. This study contributes to the expanding body of research on teacher retention in Sub-Saharan Africa. It demonstrates that improving teacher satisfaction and effectiveness requires addressing both systemic challenges, such as resource limitations and lack of recognition, and individual factors, including autonomy, mentorship, and sense of purpose.

#### **4.4. Limitation and recommendation**

Several limitations should be acknowledged. First, reliance on self-reported interviews may have led participants to present their motivations in a socially desirable manner. Second, national political tensions during data collection could have influenced participants' willingness to respond openly. Third, as the findings are drawn exclusively from public primary schools in a single city, their generalisability to other contexts is limited. Finally, the researcher's prior professional experience within the same educational system necessitated deliberate efforts to minimise potential personal bias. Fourthly, the study did not include demographic information such as marital status, ethnic groups, socio-economic backgrounds, and school type. These limitations might affect the quality of the data.

To address these prevalent issues: First, future research should take caution as single-method approach may lead to over-interpretation of data. Thus, a mixed methods approaches that combine different types of datasets could provide nuanced insights in the report. Also, future research can conduct a cross-national survey to assess teachers' and students' motivations. Moreover, research could examine how teacher motivation is sustained in students' results and explore the differences between internal and external motivation approaches concerning teacher efficacy and learners' achievement. Knowledge of these relationships may help design interventions that will bring teacher incentives in line with educational goals among policymakers, supplying longitudinal experience for testing teachers' satisfaction in their jobs, motivation, and retention in their teaching careers. These studies could focus on how specific professional development program affect teachers, alterations in the pay for teachers, and changes in teachers' perceptions of society. Such data would provide a holistic view of the conditions that enhance or erode teachers' professional commitment. Comparative studies exploring motivational factors among teachers in public and private schools in Ghana would also be valuable. Additionally, it is important to reduce class sizes, which can be achieved through hiring more teachers and building additional classrooms. Professional development opportunities for teachers should be enhanced by ensuring adequate resources are available to support continuous learning and skills development. Finally, involving teachers in curriculum development processes can foster a sense of ownership and ensure practical classroom implementation. More so, the qualitative data shows that community integration and altruistic motivation are key to teacher retention. Instead of emphasising transactional relationships with teachers, governments should employ a transformational method to strengthen community, school, and teacher partnerships. School governance initiatives that encourage community engagement might boost teachers' social support networks. Teacher training program should include ethical leadership, emotional resilience, and community engagement. This technique will increase early retention by emphasising the social value of education and delivering more extensive training.

Furthermore, this study recommends that teacher engagement and retention strategies might improve Ghana's educational policies. Like inclusive education or school health initiatives, a Herzberg-altruistic model-based teacher incentive strategy would direct nationally resources to retention. This research provides the theoretical and practical foundation for such a strategy, especially for primary education in Ghana. Future research should examine the impact of teacher motivation on instructional quality, classroom engagement, and student outcomes.

## **5. CONCLUSION**

Teacher motivation and retention cannot be attributed to a single factor, as the challenges encountered extend beyond individual concerns. Both personal characteristics and systemic issues, such as political interference, significantly influence motivation. Despite these challenges, most teachers reported that their commitment to students serves as a primary motivator. Their reasons for remaining in the profession were predominantly intrinsic and altruistic, including self-determination, witnessing student

success, supporting students in realising their potential, and a desire to contribute to society. All participants expressed a commitment to making a positive impact on students’ lives, which sustained their dedication to teaching. No significant differences in motivation or demotivation by gender were observed, as this study did not specifically compare male and female teachers in Ghana’s primary schools.

The results indicate that enhancing teacher motivation and retention in Ghana requires recognising teaching as both a vocation and a profession, supported by substantive institutional, economic, and cultural reforms. Policymakers should acknowledge the social and emotional demands of teaching and establish systems that support both teacher performance and wellbeing. Retention policies should extend beyond salary increases to foster a professional environment that values teachers, supports their development, and recognises the factors that motivate them. Without structural reforms in compensation, infrastructure, and career progression, intrinsic and altruistic motivations alone cannot sustain long-term teacher retention.

A central finding is that intrinsic motivation, including a love for teaching, commitment to student development, and a sense of social responsibility, remains a strong driver for teachers entering and staying in the profession. However, this motivation is persistently challenged by extrinsic demotivators, most notably low salaries, poor working conditions, lack of professional development, and limited career advancement opportunities. This raises important concerns about the long-term sustainability of the workforce if systemic issues remain unresolved. Yet, a small number of participants demonstrated remarkable resilience and a continued sense of purpose, highlighting the potential of teacher identity and intrinsic values in fostering long-term commitment. These findings have important implications. They suggest that teacher retention policies must go beyond salary increases and focus on cultivating a professional environment that values teachers’ contributions, promotes growth, and acknowledges their motivations. Moreover, the voices of long-serving teachers offer critical insight into what sustains teachers in the face of adversity, and how such experiences can inform more effective, context-specific policies in Ghana’s basic education sector. Many long-serving teachers expressed deep dissatisfaction with their working conditions, often stating that their continued service was driven more by a sustained commitment to teaching. It reinforces the view that improving teacher satisfaction and effectiveness requires addressing both systemic barriers (e.g., resource shortages, lack of recognition) and personal enablers (e.g., autonomy, mentorship, and a sense of purpose). Policymakers must acknowledge the social and emotional labor of teaching and build systems that support not just teacher performance, but teacher well-being.

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**AUTHOR CONTRIBUTIONS STATEMENT**

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
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- C : Conceptualization
- M : Methodology
- So : Software
- Va : Validation
- Fo : Formal analysis

- I : Investigation
- R : Resources
- D : Data Curation
- O : Writing - Original Draft
- E : Writing - Review & Editing

- Vi : Visualization
- Su : Supervision
- P : Project administration
- Fu : Funding acquisition

**CONFLICT OF INTEREST STATEMENT**

The authors state there is no conflict of interest.

**INFORMED CONSENT**

We have obtained informed consent from all individuals included in this study.

## ETHICAL APPROVAL

The study received ethical approval from the University of Otago's Ethics Committee on the 1<sup>st</sup> of March 2023 (reference number 23/011), which included a letter of permission granted by the Kumasi Metropolitan Directorate. All participants engaged voluntarily in this research, and at any time during the research, participants could withdraw from the study without harm. Participants withdrawal would prompt the destruction of any secured and confidential information. Participants completed an informed consent agreement that noted research procedures, the scope of data collection, confidentiality, and the process for withdrawal from the study. Participants' confidentiality and anonymity were carefully protected to safeguard their privacy.

## DATA AVAILABILITY

The datasets generated and analysed during the current study are available from the corresponding author, [MAA], on reasonable request.




## REFERENCES

- [1] UNESCO, *Global report on teachers: addressing teacher shortages and transforming the profession*. Paris, France: UNESCO, 2024, doi: 10.54675/FIGU8035.
- [2] A. Pearson, "Teacher resilience: long-serving teachers' perspectives on factors which have sustained them in their careers," University of Exeter, 2021. [Online]. Available: <https://hdl.handle.net/10871/129661>
- [3] J. Booth, M. Coldwell, L. M. Müller, E. Perry, and J. Zuccollo, "Mid-career teachers: a mixed methods scoping study of professional development, career progression and retention," *Education Sciences*, vol. 11, no. 6, p. 299, Jun. 2021, doi: 10.3390/educsci11060299.
- [4] H. Plauborg and K. B. Petersen, "Employing posthuman theory to explore why long-serving teachers stay in the profession, thereby calling into question the concept of retention. A literature review," *Teaching and Teacher Education*, vol. 165, p. 105137, Oct. 2025, doi: 10.1016/j.tate.2025.105137.
- [5] S. S. Boateng, "Teachers' attrition at pre-tertiary level in Ghana: a qualitative investigation into its causes and suggestions," *Journal of Education and Practice*, vol. 10, no. 14, May 2019, doi: 10.7176/JEP.
- [6] E. Ampong, "Graduate unemployment in Ghana: challenges and workable strategies," *International Journal of Research Publications*, vol. 57, no. 1, Jul. 2020, doi: 10.47119/ijrp100571720201344.
- [7] F. R. Ackah-Jnr, J. Appiah, E. A. Abedi, I. Opoku-Nkoom, and M. A. Salaam, "Quality education: critical policy considerations that impact teacher retention in schools," *European Journal of Education and Pedagogy*, vol. 3, no. 3, pp. 26–32, May 2022, doi: 10.24018/ejedu.2022.3.3.345.
- [8] J. A. Forson, E. Ofosu-Dwamena, R. A. Opoku, and S. E. Adjavon, "Employee motivation and job performance: a study of basic school teachers in Ghana," *Future Business Journal*, vol. 7, no. 1, p. 30, Dec. 2021, doi: 10.1186/s43093-021-00077-6.
- [9] M. A. Adarkwah, "Researching teacher work motivation in Ghana through the lens of COVID-19," *COVID*, vol. 3, no. 2, pp. 301–319, Feb. 2023, doi: 10.3390/covid3020023.
- [10] X. Deng, J. Chen, and Y. Zhao, "Mediation effects of positive and negative affect on the relationship between emotional intelligence and life satisfaction in rural school teachers," *Frontiers in Psychology*, vol. 14, Apr. 2023, doi: 10.3389/fpsyg.2023.1129692.
- [11] Z. Dörnyei and E. Ushioda, *Teaching and researching motivation*, 3rd ed. Third edition. New York, NY: Routledge, 2021, doi: 10.4324/9781351006743.
- [12] D. Prabjandee, "Multifaceted motivation of becoming English teachers in Thailand: beyond intrinsic, extrinsic, and altruistic reasons," *Teacher Learning and Professional Development*, vol. 5, no. 1, pp. 49–61, 2020.
- [13] V. K. Cannanure et al., "I'm fine where I am, but I want to do more: exploring teacher aspirations in Rural Côte d'Ivoire," *COMPASS 2020 - Proceedings of the 2020 3rd ACM SIGCAS Conference on Computing and Sustainable Societies*, pp. 1–12, 2020, doi: 10.1145/3378393.3403653.
- [14] I. Salifu and E. D. Odame, "Making teaching a career choice: a study of the 'pull factors' among preservice teachers in Ghana," *Journal of Education for Teaching*, vol. 51, no. 4, pp. 612–631, Aug. 2025, doi: 10.1080/02607476.2025.2537908.
- [15] D. Layek and N. K. Koodamara, "Motivation, work experience, and teacher performance: a comparative study," *Acta Psychologica*, vol. 245, p. 104217, May 2024, doi: 10.1016/j.actpsy.2024.104217.
- [16] S. Baroudi, R. Tamim, and Z. Hojeij, "A quantitative investigation of intrinsic and extrinsic factors influencing teachers' job satisfaction in Lebanon," *Leadership and Policy in Schools*, vol. 21, no. 2, 2022, doi: 10.1080/15700763.2020.1734210.
- [17] A. Obiagu, "'Not motivated but frustrated': preservice teachers' career choice motivations and professional identity in an African context," *Current Issues in Education*, vol. 24, no. 1, Feb. 2023, doi: 10.14507/cie.vol24iss1.2069.
- [18] O. Kamau, S. Muathe, and L. Wainaina, "Demographic factors and turnover intentions of teachers in public secondary schools in Kenya," *International Journal of Research in Business and Social Science (2147- 4478)*, vol. 10, no. 4, pp. 363–374, Jun. 2021, doi: 10.20525/ijrbs.v10i4.984.
- [19] I. Salifu and E. D. Odame, "Examining demographic variables as predictors of self-efficacy among university teachers in Ghana," *Issues in Educational Research*, vol. 33, no. 1, pp. 352–368, 2023.
- [20] Z. Li and W. Y. Guo, "Pre-service teachers' altruistic motivation for choosing teaching as a career: where does it come from?" *Frontiers in Psychology*, vol. 15, Apr. 2024, doi: 10.3389/fpsyg.2024.1334470.
- [21] L. K. Steinhoff, "Exploring the role of intrinsic motivation in elementary public-school educators' willingness to remain in teaching," Walden University, 2024.
- [22] J. Perryman and G. Calvert, "What motivates people to teach, and why do they leave? accountability, performativity and teacher retention," *British Journal of Educational Studies*, vol. 68, no. 1, pp. 3–23, Jan. 2020, doi: 10.1080/00071005.2019.1589417.
- [23] L. B. Shields and C. A. Mullen, *Veteran teacher resilience: why do they stay? (Springerbriefs in education)*, 1st ed. in SpringerBriefs in Education. Cham: Springer International Publishing, 2020, doi: 10.1007/978-3-030-53918-4.
- [24] E. B. Gibson, "Know your why: the resilience of positive experienced teachers," *Qualitative Inquiry in Education: Theory & Practice*, vol. 3, no. 1, pp. 3–30, Jul. 2025, doi: 10.59455/qietp.34.




- [25] L. Arthur and S. Bradley, "Teacher retention in challenging schools: please don't say goodbye!" *Teachers and Teaching*, vol. 29, no. 7–8, pp. 753–771, Nov. 2023, doi: 10.1080/13540602.2023.2201423.
- [26] M. Cochran-Smith, M. Cannady, K. P. McEachern, P. Piazza, C. Power, and A. Ryan, "Teachers' education, teaching practice, and retention: a cross-genre review of recent," *The Journal of Education*, vol. 191, no. 2, pp. 19–31, 2011.
- [27] C. Chiong, L. Menzies, and M. Parameshwaran, "Why do long-serving teachers stay in the teaching profession? Analysing the motivations of teachers with 10 or more years' experience in England," *British Educational Research Journal*, vol. 43, no. 6, pp. 1083–1110, Dec. 2017, doi: 10.1002/berj.3302.
- [28] J. McIntyre, "Why they sat still: the ideas and values of long-serving teachers in challenging inner-city schools in England," *Teachers and Teaching*, vol. 16, no. 5, pp. 595–614, Oct. 2010, doi: 10.1080/13540602.2010.507968.
- [29] C. Day and Q. Gu, "Veteran teachers: commitment, resilience and quality retention," *Teachers and Teaching*, vol. 15, no. 4, pp. 441–457, Aug. 2009, doi: 10.1080/13540600903057211.
- [30] M. Akiba, S. Byun, X. Jiang, K. Kim, and A. J. Moran, "Do teachers feel valued in society? occupational value of the teaching profession in OECD Countries," *AERA Open*, vol. 9, 2023, doi: 10.1177/23328584231179184.
- [31] C. Alexander, C. Wyatt-Smith, and A. Du Plessis, "The role of motivations and perceptions on the retention of inservice teachers," *Teaching and Teacher Education*, vol. 96, p. 103186, Nov. 2020, doi: 10.1016/j.tate.2020.103186.
- [32] D. Black, G. Hine, and S. Lavery, "Exploring challenges faced by early career primary school teachers: a qualitative study," *Australian Journal of Teacher Education*, vol. 48, no. 8, pp. 1–20, Jan. 2023, doi: 10.14221/1835-517X.6147.
- [33] F. Herzberg, B. Mausner, and B.-C. Snyderman, *The motivation to work*. New York: John Wiley & Sons, 1959.
- [34] M. A. Azewara, "Primary school teachers' motivations and perceptions of teaching in Ghana," University of Otago, 2025.
- [35] H. Williams, "The meaning of 'phenomenology': qualitative and philosophical phenomenological research methods," *The Qualitative Report*, vol. 26, no. 2, Feb. 2021, doi: 10.46743/2160-3715/2021.4587.
- [36] J. W. Creswell and J. D. Creswell, *Research design: qualitative, quantitative, and mixed methods approaches*, 5th ed. Sage publications, 2018.
- [37] J. Casely-Hayford, C. Björklund, G. Bergström, P. Lindqvist, and L. Kwak, "What makes teachers stay? A cross-sectional exploration of the individual and contextual factors associated with teacher retention in Sweden," *Teaching and Teacher Education*, vol. 113, p. 103664, May 2022, doi: 10.1016/j.tate.2022.103664.
- [38] L. E. Kim, K. Owusu, and K. Asbury, "The ups and downs in perceived societal appreciation of the teaching profession during COVID-19: a longitudinal trajectory analysis," *British Educational Research Journal*, vol. 50, no. 1, pp. 93–111, Feb. 2024, doi: 10.1002/berj.3914.

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