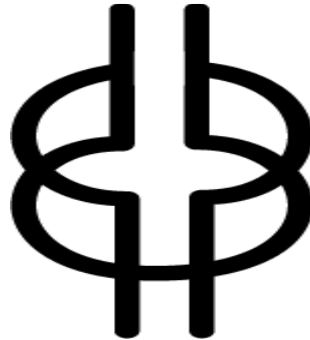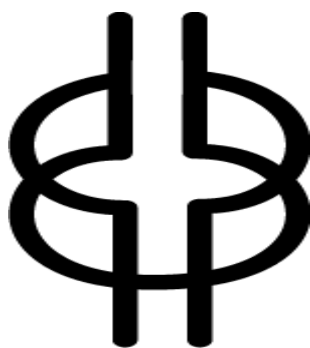# Ghana Journal of Education: Issues and Practice (*GJE*)

NYANSAPO – "Wisdom Knot"

Symbol of wisdom, ingenuity, intelligence and patience

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Editorial Comment

The Ghana Journal of Education: Issues and Practice (GJE) is a peer-reviewed journal focusing on classroom practice and policy issues that affect teaching and learning. In this volume, researchers and authors have contributed a wealth of high-quality and informative material. This volume contains four articles that have gone through the peer review process at three levels by independent reviewers.

Gladys Ami Allotey and Jophus Anamuah-Mensah address an important topic in education, that is, positive education and student wellbeing: a review of relationship between gifted and non-gifted students' wellbeing and high achievement. The authors reviewed 57 studies limited to gifted and non-gifted students including STEM subject areas, to analyse the relationship between positive education and gifted student achievements. They examined literature from 1999 to 2023. The authors found, among other things, a significant connection between well-being-focused education and academic success and provide implications of their study for practice and future research.

Samuel Kobina Otu, Kobina Impraim Adentwi and Michael Osei Aboagye investigate the alignment between the intended and enacted practical work component of the Senior High School Integrated Science curriculum in the Kwadaso Municipality in the Ashanti Region. The authors observed how eight Integrated Science teachers operationalize the Integrated Science curriculum and found a mismatch between the intentions as stated in the curriculum and the implementation of the curriculum by the teachers through their lesson delivery.

Kofi Ayebi-Arthur, Daniel Paa Korsah, Issah Bala Abdulai, Beatrice Birago and Victoria Boafo investigate the attitudes and confidence levels of Basic 7-9 teachers in Ghana regarding the implementation of the Computing Common Core Programme (CCP) curriculum. Rogers' Diffusion of Innovations Theory was used as the main framework. The participants of the study were 287 teachers from public schools across Ghana. The findings reveal among others, a high level of teacher confidence in teaching the CCP curriculum, despite limited access to ICT tools and resources. A positive, albeit insignificant, correlation was found between ICT resource availability and teacher confidence. The study recommends prioritizing the provision of ICT tools in schools and expanding professional

development opportunities for teachers to ensure the successful implementation of the CCP curriculum.

Kasimu Hamisu and Salifu Zibreal Sandawey explore the perceptions of basic school teachers in the East Mamprusi Municipality about in-service training programmes. The concurrent triangulation research design was used in the study, which included 17 public Junior High Schools in the study area. The authors found among others that in-service training programs are more effective if schools are empowered to organise such programmes for teachers. Again, participation in-service training programmes enhanced teachers' knowledge of content in their respective subject areas and enhanced teachers' knowledge on pedagogy and increased their motivation at work.

The editorial team is grateful to all reviewers for the useful feedback they offered on the papers they reviewed and the professionalism they exhibited through the review process. To the Provost of the College of Education Studies, University of Cape Coast, the team would like to say a big thank you for the continual financial and logistical support which has made the publication of GJE possible.

Positive Education and Student Wellbeing: A Review of Relationship between Gifted and Non-Gifted Students' Wellbeing and High Achievement

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Abstract

In the pursuit of fostering creativity and technology for innovative economies, students' wellbeing has grown globally. Positive education, which emphasises nurturing strengths for wellbeing and peak performance, plays a crucial role. Yet, research on its impact in disciplines, especially STEM areas, is limited. This article reviews 57 studies limited to gifted and non-gifted students, including STEM subjects, to analyse the relationship between positive education and gifted student achievements. Examining literature from 1999 to 2023, the study highlights the significant connection between wellbeing-focused education and academic success. Findings reveal that not only individuals' character traits, constitute inward restorative defenses against mental health issues across all age groups but also the gifted, particularly gifted males, are more susceptible to mental disorders compared to their non-gifted and normal or average-intelligence counterparts. The research highlights the importance of identifying gifted students early, utilising their potential for wellbeing and improved outcomes, especially in interdisciplinary fields such as STEM. Incorporating gifted education and wellbeing into pre-service teacher education through holistic institutional approaches is crucial, particularly in the context of developing African nations. The study also suggests socio-emotional development for advancing academics, especially in STEM. This research suggests future exploration into the intersection of positive education and students' academic accomplishment.

Keywords: Positive psychology; gifted students; mental health; STEM subjects.

Background to the Study

This study illuminates both the problem under investigation and the study's overarching purpose. At its core, this research embarks on an exploration of the relevant academic literature concerning the intricate relationship between positive psychology and gifted students' wellbeing. In particular, it delves into the examination of the positive emotion, engagement, relationship, meaning, and accomplishment (PERMA) Model, with a specific emphasis on its hedonic and eudaemonic dimensions. Additionally, the study investigates key concepts such as positive education, institutional initiatives, and transnational practices in promoting well-being. This contextual exploration has a twofold aim: Firstly, to furnish a comprehensive framework that enables a rigorous assessment and extension of prior research findings. Secondly, it entails a meticulous analysis and exhaustive discussion of the research findings. The purpose of this review is not only to explore the relationship between positive education and well-being among both gifted and non-gifted students, and to analyse its impact on their academic performance, but also to understand the specific group of the youthful population that may be at risk of developing psychological disorders if their learning needs are not addressed.

Problem Statement

The wellbeing of gifted students' mental health in schools, is a crucial indicator of their psychological health (Sharma, 2017). A global survey conducted across 30 nations comprising 35 indicators revealed that only eight high-income countries, representing eleven percent of the total youth index coverage, provided substantial levels of youth well-being with a significant number of young people worldwide experiencing traumatic lives or mental ailments (Global Youth Well-being Index, 2014; Global Youth Well-being Index Ranking, 2017; Sharma, 2017).

Within highly developed nations, one can find disparities in youth satisfaction with their lives (Högberg, 2019). In countries such as Canada and the United States, the youth have shown some minimal levels of life satisfaction, compared to the United Kingdom which exhibits slightly higher levels (UNICEF, 2013). However, there are important variations in other regions, including the Middle East, South Africa, and North Africa, where the youth experience the lowest levels

of life fulfillment and higher unemployment rates, with West Africa experiencing a significant increase in psychological disorders among its youth (Sharma, 2017). A case study by Arslan, Allen, and Ryan (2020) in Turkey highlighted the need for wellbeing educational intervention programs in schools to improve youth belongingness, life satisfaction, and overall mental health.

This assertion suggests that the youth in developing nations may be more vulnerable to mental health challenges. Poor infrastructure in these nations may hinder educational well-being and individual ability development for goal pursuit (Ryan & Deci, 2001). Consequently, a lack of youth well-being in society can lead to setbacks, including low socio-economic standing, suicide challenges, and migrations (UNICEF, 2016). Ryan and Deci (2001), in their examination, highlight that in less prosperous nations, there is often a prioritisation of materialistic and financial goods over psychological well-being. This emphasis tends to revolve more around the acknowledgment of giftedness and unique qualities. These barriers can hinder equal access to opportunities for a worthy and enjoyable life, potentially contributing to mental health conditions among students despite their high academic achievements.

Schools play a significant role in students' well-being and their development (OECD, 2014). Promoting well-being through positive education and integrating traditional education models with interdisciplinary areas including science, technology, engineering, and mathematics (STEM) can assist in fostering positive life outcomes for all students (Morrison & Peterson, 2013; Seligman et al., 2009). According to Ozkan and Kettler (2022), such integration of disciplines can make a difference as STEM education positively influences the intellectual and socio-emotional development of the gifted.

This review investigates the association between positive education and well-being among students and its effects on their academic achievement. It focuses on research conducted from the well-being perspective, particularly the PERMA model of Seligman (2011) and the PERMA-H model of Norrish, Williams, Connor et al (2013), by reviewing relevant literature in positive psychology and its application from 1994 to 2023. By identifying potential gaps and exploring the well-being of different student groups such as the gifted, non-gifted, and average intelligence, this study seeks to better

understand the relationship between positive education and high attainment.

Purpose of the Review

The prevalence of mental health issues among the youth is a pressing international concern; however, there exists a significant gap in our understanding of the specific categories of youth affected. This gap includes whether the challenges are experienced by those who fall within the average intelligence range, those who are gifted, or those who are non-gifted. This study endeavours to address this knowledge gap while also investigating potential gender-related disparities in mental health issues among the youth. It is well-established that students possess diverse learning capabilities and experiences. Consequently, there is a compelling need for an integrated approach to education that includes well-researched intervention programs tailored to accommodate these learning needs (VanTassel-Baska, 2018). The inadequacy of a one-size-fits-all education model in meeting the diverse needs of students has been emphasised by various researchers (Allotey, 2019; Allotey, Watters, & King, 2020; Tofei-Grehl & Callahan, 2017).

The unique characteristics of gifted students, including strengths and personality attributes, require targeted educational interventions towards integrating positive psychology in fostering achievement. The work by Andersen, Rod, Holmberg, Ingholt, Ersbøll, and Tolstrup (2018), explores the impact of positive psychology interventions on the academic performance of gifted students, offering specific strategies and assessing their effectiveness. Historical and contemporary studies, including Frasier and Passow (1994), Pfeiffer and Stocking (1999), Reis and McCoach (2000), and VanTassel-Baska (2018), collectively affirm the significance of character strengths in giftedness. These studies provide insights into the distinct susceptibility and specific character strengths that gifted individuals exhibit, thereby strengthening the argument presented in this review. Thus, naturally, the gifted character strengths, talents, or inward abilities make others perceive them as habitual idiosyncratic thinkers. The authors described this personal quality as the innermost psychological risk factors of the gifted traits. This characterisation requires increasing global attention of educational practitioners; researchers and stakeholders in education to provide appropriate education and policies toward fostering students'

resilience, and positive wellbeing on mental health preventive therapeutic interventions for both the gifted and the non-gifted at all levels of education (Chan, Purcell, & Power, 2016). These gifted characteristics encompass a range of abilities and virtues that can facilitate their academic achievements (Carman, 2011; Frasier & Passow, 1994) and overall wellbeing (Seligman, 2011; Norrish et al., 2013).

Additionally, gifted students, like other students, may face psychological challenges mostly when the traditional curriculum does not cater to their specific learning and emotional needs, which can lead to stress, depression, boredom, social exclusion, limited self-esteem and contribute to underachievement and school dropout (Allotey et al., 2020; Matheis et al., 2017; Reis & McCoach, 2000).

Moreover, other studies have shown that gifted youth have higher stress levels and lower life satisfaction compared to their non-gifted peers (Altay, Kilicarslan, & Yildiz, 2017; Fouladchang & Vahideh, 2010), and they may not fully enjoy overall well-being in schools due to inadequate positive emotional support (Matheis et al., 2017; Pfeiffer & Stocking, 1999). A comprehensive review spanning the years 2007 to 2017 examined eleven studies focused on the healthcare and family-related concerns of gifted children and youth, aged between two and eighteen (2-18) years old (Altay et al., 2017). Findings revealed that 81% of emotional health complications are prevalent amongst the gifted cohort. Similar to these findings is Amini (2005) work about students' life stress inventory and self-esteem inventory stressors with 340 high school students both gifted (156) and non-gifted (184) from four high schools in Shiraz. Findings indicate that gifted students not only show high levels of self-esteem but also exhibit a considerable level of cognitive reaction to stress, with boys having a high degree of frustration compared to girls. Congruently, Bennett-Rampell and Northcote (2016) work suggested that both the gifted and non-gifted individuals require motivation toward purposeful life, resilience to achieve, with Busch and Nuttall's (1995) reporting that, a student with motivational difficulties is likely to have attention deficit.

The above discussion suggests that, the characteristics of gifted students make them susceptible mental health issues leading to underachievement if their diverse learning needs are not addressed effectively compared to the non-gifted. The review indicates that

cultivating a strong resilience constitutes a safeguard in advancing individuals' inward ability. Nevertheless, there is limited research about the association between positive well-being including the gifted, non-gifted, and normal intelligent students' achievement. This study will examine this relationship by reviewing literature relating to PERMA model of Seligman (2011) and Norrish et al., (2013) PERMA-H model; to compare, analyse and explore some linkage (s) (if they exist) among students' well-being and achievement in the subsequent sections.

Contextual Exploration

Positive psychology promotes well-being and positive life qualities among individuals, communities, and societies (Park et al., 2014; Seligman & Csikszentmihalyi, 2000). It encompasses both hedonic and eudaemonic well-being, which are interconnected and essential for achieving optimum results, including high academic performance and less psychological health concerns among students (Keyes & Annas, 2009). Positive psychology emphasises individual strengths and character development (giftedness and talents), which are crucial in fostering resilience and overall well-being (Ryan & Deci, 2001). Focusing on positive psychology interventions can address emotional challenges experienced by high-ability students and enhance their resilience and defensive fitness (Duan, Chen, & Ho, 2020).

Donaldson, Dollwet, and Rao's (2015) review showed the frequent use of well-being with a focus on resilience and character strength development. Positive psychology interventions can contribute to students' overall functioning and contentment by fostering positive social-emotional aptitudes and cultivating resilience. However, there remains limited research on the association between positive wellbeing and academic performance among different groups of students, including the gifted, non-gifted, and those with normal intelligence.

Positive psychology does not only denote positive life functioning but also uncovers giftedness and talents as personal attributes, now character strengths, as character strengths among exceptionally high-achieving youth are interrelated. Salmela and Uusiautti's (2015) evaluation of the character strengths of the highest achieving graduates in upper secondary education in Finland, revealed the occurrence of ten-character strengths, including 24 positive traits which are valued across all cultures. Specifically, descriptions reflected

strengths of wisdom and knowledge such as curiosity, love for learning; courage or mental fortitude, perseverance, and authenticity with love representing valuing of close relationships and fairness (Salmela & Uusiautti, 2015). Regarding knowledge and passion for learning, gifted youths are comparable, tied with grit and sovereignty, gratitude and cheerfulness from social relationships and support.

PERMA Model with Hedonic and Eudaemonic Relationship

The two components of well-being hedonic and eudaemonic denote positive traits and the act of good feeling and life gratification (Keyes & Annas, 2009; Ryan & Deci, 2001). Hedonic notion concerns achieving pleasure and well-being through experiences of pleasure and enjoyment. For example, hedonic experience is to maximise pleasure and minimise displeasure or painful life. The eudaemonic concept also deals with achieving well-being and happiness through purpose and meaning. That is, the consequences of pursuing self-growth and self-actualisation lead to optimal life functioning and satisfaction. Unlike hedonic well-being, which is achieved through pleasant and enjoyable life experiences, eudaemonic happiness is accomplished through meaningful and purposeful events, including a well-functioning life of character development and determination in life through positive social operation, community involvement, and meaningful relationships (Keyes & Annas, 2009; Ryan & Deci, 2001). Although eudaemonic and hedonic well-being are empirically and conceptually different, they are interconnected with other variables (Karademas, 2007; Keyes & Annas, 2009) with Coulombe, Hardy and Goldfarb (2021) suggesting that promoting all-inclusive students' wellbeing is required of every educational policy and intervention.

Importantly, integrating both hedonic and eudaemonic wellbeing constructs to form the popular PERMA model developed by Seligman (2011) is warranted, particularly, because of the relevance of the five constructs; positive emotion, engagement, relationships, meaning and accomplishment. The model contains components that recount both hedonic and eudaemonic wellbeing as a multidimensional model of well-being or 'flourishing'. This model is central to this study because its associated measure is relatively comprehensive but transitory, with each mechanism including more than one item per construct (Hone et al., 2014). Although there are other related frameworks, the nature of this study compelled the authors to review

papers regarding youth wellbeing and attainment; positive emotion, engagement, relationships, meaning, and accomplishment, which are contained within the PERMA model. This study considers the five facets as essential in aiding the discourse on the topic. Moreover, every element of the model is linked to endorsing individuals' well-being (Seligman, 2011) to foster achievement, which is the object of this paper.

The conception of well-being comprises both hedonic and eudaemonic wellbeing and is crucial to understanding students' successes (Norrish et al., 2013; Slee & Skrzypiec, 2016). Whereas few studies advocate that adolescents experience high levels of hedonic well-being with a shortfall in eudaemonic well-being, other studies emphasise the opposite (Keyes & Annas, 2009; Kryza-Lacombe, Tanzini, & Neill, 2019). Consequently, most studies conducted with students have shown that both eudaemonic and hedonic wellbeing are essential in achieving high academic performance with fewer psychological health concerns (Keyes & Annas, 2009). Thus, the relationship between meeting one's highest potential and achievement may be addressed through a focus on positive psychology.

A German study conducted by Lo, Wong, Lam, and Shek (2018) and an Australian investigation by Matheis et al., (2017) explored the perceptions of high-ability preservice teachers, revealing concerns about the inadequate development of positive social-emotional aptitudes among high-ability students. In contrast, another study conducted by Duan, Chen, and Ho (2020) has demonstrated that positive psychology holds promise in addressing these issues. To Duan et al., (2020), individuals' inward abilities develop resilience amid difficulties and adaptation right from preschool; indicating that, individuals' internal power or ability assists in overcoming emotional maladies and defending psychological health and wellbeing as individuals' aptitude or giftedness is malleable and subject to change.

This personal facility appears to be a complementary 'self-restorative protector' if highly developed with a positive social touch, cultivates a strong resilience to guard against negative mental conditions. Therefore, analysis of the literature is in line with Duan and associates' (2020) application of positive psychology which denotes individuals' ability and psychological needs development and can address the achievement of youthful life functioning and contentment. Whereas positive psychology constitutes the experiential study of

meaning, success, and wellbeing, positive education combines traditional education principles with the study of happiness and wellbeing, especially Martin Seligman's PERMA, which draws on positive psychology's emphasis on individual strengths and personal motivation in promoting learning. Unlike traditional school approaches, positive schooling teachers use systems that focus on the wellbeing of every student. The application of these psychological sciences not only increases mental well-being but also guards against the development of mental illness.

Positive Education and Institutional Initiatives

Positive education, which promotes wellbeing and high educational attainment, has become an important topic in educational research (Seligman et al., 2009). Many studies and intervention programs have been conducted to foster positive youth development, resiliency, and character strengths (Adler, 2016; Bonell et al., 2016; Duan et al., 2020), constituting nurturing 'giftedness and talents' in individuals.

Global organisations like the International Positive Education Network and the Positive Education Schools Association have embraced the concept of positive education, and educational policies are increasingly prioritising students' wellbeing (Coulombe et al., 2021). Countries like Bhutan and Peru have implemented positive education initiatives in their school systems to improve happiness and well-being among students (Adler, 2016). Positive education also aims at enhancing students' functioning and achievement, with character strengths being linked to positive youth development and overall well-being (Duan et al., 2020; Schutte & Malouff, 2019).

The impact of a whole-school positive education approach on students' learning experiences was examined in a case study conducted at a boys' private school in Australia (Riedel et al., 2020). The study precisely delved into the transformative initiatives, revealing that they not only promoted meaningful active learning experiences but also demonstrated an inclusive scope and methodological rigour. Riedel et al. (2020) detailed the interventions employed, showcasing their effectiveness in fostering active learning. Importantly, the study method utilised in this case study involved an exploration of the student learning experience among ten senior high school students within an all-boys private school in New South Wales, Australia, where a whole-

school positive education initiative was implemented. Employing semi-structured focus group interviews, the study identified that active engagement and participation were central to the observed positive effects. This approach enhances the credibility and reliability of the study's claims, contributing to the depth of evidence supporting the positive influence of the whole-school positive education approach.

One significant aspect highlighted in the study was the pivotal role of family and community involvement in the successful implementation of these initiatives. By incorporating this vital element, the researchers emphasised the practical implications of their findings and reinforced the real-world applicability of the positive education approach. Moreover, positive psychology and positive education programs do not only share the common goal of developing individuals' character strengths and growth in abilities (Howell & Hill, 2009; Ryan & Deci, 2001) but also influence students' perceptions of success and prosperity, with their participation in social associations and well-being activities (Trask-Kerr, Chin, & Vella-Brodrick, 2019). However, students without positive education exposure tend to define success based on traditional stimuli (money or natural resources) and cultural norms. Overall, positive education is essential for promoting students' well-being which goes beyond money and natural resources by expanding their definitions of success and prosperity through character development and growth (Howell & Hill, 2009; Ryan & Deci, 2001; Trask-Kerr et al., 2019). This is critical for society's wellbeing. Positive education exposure can therefore help shift students' beliefs and contribute to their overall positive development.

Transnational Practices of Positive Education and Wellbeing Characteristics
Positive education is becoming crucial in promoting students' wellbeing and ensuring their overall success. Studies have shown that focusing on a wellbeing curriculum do not only improves students' wellbeing but also enhances their academic performance (Adler, 2016; Seligman, 2011). One study that examined the effects of integrating the teaching of well-being with traditional subjects and its impact on students' academic performance in Peru, Mexico, and Bhutan, revealed that explicit teaching of useful skills embedded into academic subjects positively impacted students' engagement, quality of relationships, and

perseverance, leading to improved wellbeing and academic achievement (Adler, 2016).

Unlike the developed nations where the gifted students learning needs are catered for, studies about giftedness in Ghana and Africa have shown that gifted students' diverse learning needs are overlooked as they challenge teachers' authority, and make them appear inferior, have magical powers, and that both the gifted, non-gifted, average, and struggling students go through the school system unnoticed (Allotey, 2019; Allotey, Watters, King, & Anamuah-Mensah, 2023; Ngara, 2017). Deku's (2013) work on the identification of giftedness in Ghana disclosed that the gifted are the most marginalised in the Ghanaian educational system.

The relationship between wellbeing education and academic achievement is also evident in other studies. A study by Lindorff found a positive connection between well-being enhancement and academic outcomes, although more research is needed to establish the exact measure of effect sizes (Lindorff, n.d). Well-being may have a motivating effect on academic attainment. However, students from low socioeconomic backgrounds may face challenges in maintaining this relationship, highlighting the need for tailored approaches to accommodate their specific learning ability needs (Adler, 2016; Lindorff, n.d).

Additionally, parental contributions are crucial in promoting positive education and wellbeing among students. Studies have shown that parental involvement is highly beneficial, especially for students from low socioeconomic status families (Adler, 2016; Riedel et al., 2020). Academic socialisation, which refers to the process by which individuals acquire the knowledge, skills, and values necessary for academic success, is positively associated with academic attainment. Simultaneously, participation in home-based activities is correlated with overall school performance. This suggests that both school and family involvement play crucial roles in contributing to students' success (Duan et al., 2015; Trask-Kerr et al., 2019). Positive education integrates well-being components, such as positive emotions, engagement, relationships, meaning, and accomplishment, into traditional subjects and instructional practices (Lee, Krause, & Davidson, 2017). Successful music programs in Australian schools demonstrate the importance of teamwork and partnership between teachers, school staff, students, parents, family, local community

members, entrepreneurs, and musicians in promoting students' wellbeing and aptitudes (Lee et al., 2017). Positive education practices, therefore, extend beyond the school context and content, involving various stakeholders to create a holistic environment for students.

While positive education has positively affected students' academic and non-academic development, poorly structured intervention programs may lead to negative outcomes (Humphrey, Lendrum, & Wigelsworth, 2010). A national evaluation of the social and emotional aspects of learning program in England found inadequate influence on students and school outcomes, highlighting the importance of professional exposure and well-structured intervention programs for positive results (Humphrey et al., 2010).

Research Questions
Three research questions drive this review:
1. What are the links between wellbeing promotion in schools and students' high achievement?
2. How do positive psychology-based interventions contribute to fostering positive emotions and mental health among students from diverse cultural backgrounds to flourish in both academic and personal aspects?
3. How or What roles do positive psychology interventions play in preventing/reducing socio-emotional and mental health concerns among gifted and non-gifted students to enhance their academic achievement?

These three research questions (RQs) will be addressed based on the analysis described in Phases One, Two, and Three in the subsequent sections.

Results and Discussion
Wellbeing Components and Students' High Attainment

Phase One Analysis of RQ1: What are the links between wellbeing promotion in schools and students' high achievement?
This section explores the connection between well-being education and students' high achievement. We evaluate literature concerning flourishing (hedonic and eudaemonic) to note the trade-off and relatedness in addressing RQ1. Interestingly, while some studies

believed that hedonic or eudaemonic wellbeing is linked to students' high academic performance, others endorse both concepts.

A study investigated students' academic attainment and its relationship with hedonic and eudaemonic wellbeing among urban college students in the United States, especially in Washington (Kryza-Lacombe, Tanzini, & Neill, 2019). Students who were dissimilar and came from diverse socio-economic backgrounds and cultures were at risk for poorer academic outcomes. Findings unveiled that while eudaemonic levels of motives are positively connected to students' GPA and emotional outcomes for college success, hedonic reasons were unrelated. However, individuals with high levels of hedonic and eudaemonic motives (total functioning life) had higher GPAs compared to students with low levels of eudaemonic. Nevertheless, they did not vary from those with high eudaemonic and low hedonic. Kryza-Lacombe and associates' (2019) work showed that eudaemonic construct negatively correlates with depression and stress, indicating that individuals with elevation levels of eudaemonic possessed the lowest level of such emotional disorders compared to those with low levels of eudaemonic. Thus, the eudaemonic domain may hold promise for high college results.

Another study in the US re-examined MIDUS national data on mental health from previous papers about the unwarranted nature of the distinction between hedonic and eudaemonic wellbeing (Keyes & Annas, 2009). Findings of the report revealed that only 18% are thriving out of nearly half (48.5%) of the national sample with high hedonic well-being aspect, expressing the need for high-level hedonic and eudaemonic wellbeing application in schools. Other results indicate that while the 30.5% remaining had higher levels of hedonic wellbeing, their eudaemonic wellbeing was moderately low, with a doubled rate of mental illness. The authors concluded that without distinguishing hedonic and eudaemonic wellbeing from scientific perspectives toward achievement, we incur costs as citizens of society. This position shows that relying on the combination of these two segments of wellbeing may enable total functioning and life gratification to achieve highly. It shows that we may risk the future life prospects of our youth by depending on only one facet in developing their competencies.

Arslan and Renshaw's (2018) proposed that students with advanced life gratification at school possess greater positive academic experiences toward flourishing while those with lower wellbeing are at

higher risk of behavioural difficulties and school dropout. To Arslan, Allen, and Ryan (2020), school membership was a substantial predictor of youth external and internal issues and overall life contentment, with social acceptance strongly forecasting youth's life satisfaction, while social exclusion was a strong predictor of both internal and external challenges. Thus, interventions implemented within school settings have the capacity to mitigate future mental health issues and enhance overall wellbeing. The above review highlights the complexity of the relationship between well-being and academic achievement. Some studies suggest a positive association between eudaemonic wellbeing and academic success, while others support the integration of both hedonic and eudaemonic to achieve (Keyes & Annas, 2009; Kryza-Lacombe et al., 2019). This review supports the need for a multidimensional wellbeing approach that considers students' individual strengths (giftedness), competencies, and resiliency abilities (Duan et al., 2020).

Telzer and colleagues (2014) employed reward-related neural activation toward both hedonic and eudemonic feelings, describing that while decisions on eudaemonic motives envisage longitudinal declines in depressive symptoms, hedonic decision envisions increases in depressive indications. That is, neural activation within an individual seems to be a source of both risk and defense mechanisms. Such risk factors have been unveiled in this review as 'inward risk restorative guard', to mean an individual's ability and inner security factors endorsed by Duan and colleagues (2020) as a 'competency power' that needs to be cultivated through integration with the whole school approach to cultivate each student holistic wellbeing and high achievement. This innermost ability is ameliorated and grows over time (Dweck, 2006); with resilience (Duan et al., 2020) as an 'inbuilt special growing facet'.

Remarkably, this current review unveiled that over the last decade, there have been continuous, substantial global reductions in children's and youth's well-being. As noted in Clarke (2020) about the recent unavoidable 'trade-off' proposition made by Gabriel Heller-Sahlgren, regarding the association between children's wellbeing and their academic success; Gabriel drew on PISA 2012 data reporting that, students' happiness and high accomplishment are not compatible; suggesting a new decision to that effect by policymakers in England. After Gabriel's proposal, Clarke's (2020) discussion on children's

wellbeing reviewed the evidence that reinforces and compares multinational similarities from psychological and educational viewpoints to establish the existence of an empirically supportive connection with academic performance. In contrast to Gabriel Heller-Sahlgren's report, Clarke's (2020) results revealed that children's wellbeing and accomplishment are positively correlated.

However, this association is not up-front and involves a careful unravelling of hedonic and eudaemonic wellbeing components. Relative to this recent knowledge about children's wellbeing, Clarke (2020) further highlights the following four gaps associated with wellbeing and attainment link: (1); a conception of multidimensional and quantifying wellbeing (2); examining the mediating paradigms that describe the wellbeing-attainment; (3); objective operation of achievement, and (4); enquiry of developing changes. Clarke (2020) encouraged governments to avoid untruthful dichotomies when making policy approvals. In support of Clarke's (2020) findings, it is evident that, children's wellbeing and achievement are compatible, and this appears to be a common theme throughout this present review. Nevertheless, the linkage is entrenched and not directly noticed among students or children. However, through playful learning activities, children develop an 'excitement-resiliency flow', which manifests itself through consistent engagement of thinking toward distinct problem solving, and therefore, not forthright. Subsequent to the results disclosed by Clarke (2020), this study takes note of two key issues; that individuals are dissimilar in socio-economic status (SES), gender, and ethnic cultural background; similarly, families, friends, classmates, parental and community participation in developing children's wellbeing are key (Coulombe et al., 2021; Riedel et al., 2020).

This literature review seeks to address some of the salient gaps highlighted in Clarke's analysis. First, to measure wellbeing is to identify an individual's concomitant strength and capability (giftedness) toward growth as a predictor of increasing self-esteem and goal achievement (Coulombe et al., 2021; Seligman, et al., 2009).

Second, individuals from infancy have inner powerful facilities (Duan et al., 2020), hence, well-being effort can be quantified based on the amount of resilience developed to defend and restore ability losses. This study describes a cohort of children, youth, and students as 'high ability and non-high ability; high achieving or non-high achieving, and

the normal intelligent individuals, and that every individual is unique with an inner aptitude.

Third, this inward ability is independently owned, and intrinsic and extrinsic pleasures emerge to boost positive engagement, positive emotion, positive quality-life relationships, and realising positive achievement (Seligman, 2011; Seligman et al., 2009). The endorsement of a multidimensional and holistic approach to positive education, as highlighted by Coulombe et al. (2021), holds particular significance in developing the aptitudes of all students including STEM-gifted students. However, in Ghana, studies have shown that teachers have naïve beliefs about gifted students' development (Allotey, 2019; Allotey et al., 2020). For example, a case study examined ten Ghanaian science and mathematics teachers' opinions about the pedagogical practices they adopt in developing gifted students (Allotey et al., 2020). Findings indicate that providing for gifted students' learning needs may lead to inadequate instructional time for other students, accounting for inequality and elitism. Teachers disregard differentiation and identification strategies in Ghanaian mainstream classrooms (Allotey et al., 2020; Allotey, 2019). Allotey's (2019) work with mathematics and science teachers concerning gifted students' development in Ghana reveals that they often use gifted students for roles such as peer tutors and teaching assistants, as well as positioning them as role models and mentors in mainstream classrooms, rather than focusing on developing their competencies. This practice according to Maree's (2018) South African study in giftedness has shown that such training diverges from the conventional approach of nurturing the talents and skills of gifted students.

Support to cultivate giftedness in an individual is essential for fostering idiosyncratic pursuits and positive wellbeing. In the realm of STEM giftedness, research examining the academic achievement and social-emotional development of the gifted has consistently demonstrated by Ozkan and Kettler (2022), Cross and Dockery (2014), and Ulger and Çepni (2020), provide valuable insights into the educational interventions and support mechanisms that contribute to the optimal development of STEM talents among gifted students.

Overall, this review advocates for a multidimensional and holistic approach to positive education, considering the unique diverse needs of every student. By developing students' resiliency, competencies, and self-restorative mechanisms through positive

education, schools can foster a positive learning environment that promotes wellbeing and high academic achievement in traditional subject areas including STEM across the world.

Insights into Social-Emotional and Mental Health Challenges among Students

Phase Two Analysis of RQ2: How do positive psychology-based interventions contribute to fostering positive emotions and mental health among students from diverse cultural backgrounds to flourish in both academic and personal aspects?

This section examines the application of positive psychology in promoting positive emotion and mental health among students from different background cultures. The integration of positive education into the regular school curriculum has been found to predict lower academic impairment and reduced suicidal behaviours.

Utilising the Patient Health Questionnaire screening scales, a study explores the mental health concerns such as depression and anxiety disorders in the US involving 5,689 college students (Keyes & colleagues, 2012). This includes inquiries regarding suicidal thoughts, negative plans, and its effects on academic performance. Findings revealed that students who received flourishing experiences demonstrated lower rates of mental ailments, minor suicidal behaviours, and better academic achievement. In contrast, non-successful students exhibited higher risks of mental complications, suicidal behaviours, and academic impairment.

Furthermore, recent research by Datu (2018) highlighted the link between Filipino undergraduate students' life satisfaction, optimism, positive emotions, mental health concerns, and academic achievements. The study demonstrated that flourishing not only predicts strong intellectual insight and well-being but also envisages students' objective academic successes. This highlights the importance of developing positive emotions and mental health to enhance students' overall academic performance

Considering the importance of early intervention, Lo et al. (2018) reviewed medical records from the Mental Wellness Clinic at a university in Hong Kong. Findings indicate that anxiety, depression, and subthreshold mental and emotional indications were the three most prevalent diagnoses, accounting for 76% of all cases. In addition, a significant proportion of students exhibited dynamic suicidal thoughts

or attempted suicide, requiring urgent psychiatric intervention. Stress from academics, family, peers, and romantic relationships were identified as common themes contributing to maladjustment. The authors stressed the need for increased attention to students' cultural backgrounds. They proposed early intervention through a whole-school approach from primary to high school and undergraduate levels to promote well-being awareness.

Additionally, whole-school positive psychology-based interventions positively impact non-academic outcomes among students, including motivation, mental health, self-esteem, self-confidence, and reduction of dropout rates. One notable study provides evidence for the effectiveness of such interventions. Shoshani and Steinmetz (2014) conducted a study in Israel, implementing a whole-school positive psychology-based intervention in a secondary school involving 537 students in the seventh to ninth grades. Compared to a control group of 501 students in a different school, the intervention group showed significant reductions in distress, anxiety, and depression, and increased self-esteem, self-efficacy, and hopefulness. This suggests that fostering positive emotions through positive psychology interventions can enhance students' self-confidence and mental resilience, thereby positively impacting their academic endeavours.

Consistent with a U.S. study, Ozkan and Kettler's (2022) explores the impact of STEM education on gifted students' academic achievement and social-emotional development. Analysing 28 studies through meta-synthesis, the research reveals that integrating positive psychology into STEM education positively influences gifted students' self-confidence and mental resilience by reducing their distress, anxiety and depression and enhancing self-esteem and self-efficacy. The study aligns with positive psychology principles, showcasing how a positive educational environment can contribute to the overall well-being of the STEM gifted students by addressing their academic, social, and emotional needs. This aligns with Almukhambetova and Hernández-Torrano's (2020) work in Turkey, suggesting that, positive psychology integration into STEM education helps prevents underachievement among the gifted in schools and universities.

Unlike the developed nations with several research regarding positive psychology integration with the traditional subjects' areas for students' well-being, studies in Ghana have shown that support services

for the gifted students' needs are ignored due to teacher's scant knowledge about gifted education practices (Allotey, 2019; Allotey et al., 2023; Deku, 2013). Allotey et al. (2020) work drew data from ten science and mathematics teachers' views about the strategies they suggest for supporting gifted students in Ghana. Findings revealed that giftedness strategies such as problem-solving and critical thinking are teacher-led within instructional classrooms. Moreover, gifted students are seen as threats to teachers, and do not need extra support to achieve. Hence, their learning needs are unheeded. Although positive psychology principles were not explored by Allotey et al., (2020), Deku's (2013) work in Ghana indicates that the gifted students' varied learning needs are not accommodated. Thus, the STEM gifted students' holistic needs be it positive psychology are overlooked.

Another Ghanaian case study examined the perspectives of ten mathematics and science teachers regarding the development of gifted students alongside the experiences of seven school dropouts (Allotey et al., 2023). Findings revealed a concerning trend; gifted students can achieve on their own; teachers displayed limited understanding of giftedness and lacked training in gifted education, and ignored the gifted cohort. Teachers exhibited misconceptions about gifted students' development, failing to adequately develop their potential, accounting for underachievement and school drop-outs. This oversight was exacerbated by prevalent misconceptions and stereotypes held by teachers, hindering the effective accommodation of gifted students within the educational system.

In conclusion, whole-school positive psychology-based interventions have shown promising results in improving students' mental health, self-esteem, and motivation, leading to reduced dropout rates. The presence of positive emotions contributes to students' overall well-being and strengthens their ability to face academic challenges with greater confidence particularly, STEM gifted individuals. These findings highlight the potential of positive psychology approaches in creating a supportive and flourishing learning environment for all students.

Prevailing Positive Emotions and Mental Health Ailments among Gifted and Non-gifted Youths

 Phase Three Analysis of RQ3: What roles do positive psychology interventions play in preventing/reducing socioemotional and mental

health concerns among gifted and non-gifted students to enhance their academic achievement?

This section presents socio-emotional and mental health challenges faced by both gifted and non-gifted students. For example, within the educational system, gifted students and other high-ability students often experience feelings of loneliness, depression, and frustration when their educational needs remain unaddressed during their formative years (Allotey et al., 2019; Matheis et al., 2017). However, this can be addressed through the integration of positive education with the mainstream curriculum (Suldo, Hearson, & Shaunessy-Derick, 2018). While summarising positive psychological concepts, Seligman and Csikszentmihalyi (2000) expressed the relevance of enhancing individuals' lives and developing exceptional talents with a focus on positive well-being. Their goal was to promote happiness among the general population by fostering excellence through research efforts, particularly in developing the exceptional abilities of young individuals. Positive social contexts, including healthy schools, communities, families, and parental inputs, were identified as contributors to shaping positive experiences for all students, including high-achieving youths.

While numerous studies have emphasised the importance of fostering positive well-being indicators among the gifted and the non-gifted individuals, this section delves into an exploration, drawing primarily from the wide-ranging insights of (Datu, 2018; Lo et al., 2018; Seligman et al., 2009; Suldo et al., 2018), and supplemented by additional research findings that illuminate the multifaceted dimensions of their mental and emotional wellness, and positive self-perception toward high school performance. However, it is important to note that many studies on gifted students' potential and affective necessities have focused on vulnerabilities, risk factors, and deficits associated with academic subjects such as STEM (Margot & Kettler, 2019) and mental health outcomes (Mathias et al., 2017).

In the study conducted by Eren, Cete, Avcil, and Baykara (2018) in Turkey, the authors examined various aspects of life quality, mental health issues, parental and family functionality, social-emotional behaviours, and in two groups of children aged 9 to 18 years. The study compared gifted children with those categorised as having "normal intelligence." While the term "normal intelligence" was not explicitly defined in the study, it generally refers to individuals with

cognitive abilities in the average range for their age. Gifted children, on the other hand, demonstrate cognitive abilities significantly above average and may receive specialised educational provisions. The study aimed to shed light on the differences between gifted children and those with normal intelligence. Findings revealed that, unlike normal intelligence children, gifted children described themselves as highly inattentive and lively, and they showed low social functionality and perceived their physical health status poorly. When distinguished by gender, although gifted boys exhibited high symptoms of depression alongside high academic performance, gifted girls reported low depressive symptoms. Additionally, the parents of normal intelligent boys reported lower performance relative to the gifted boys, but there was no reported comparative attainment difference for girls. This variation in academic achievement exists because, by definition, gifted students experience greater attainment in school (Suldo et al., 2018).

Consistent with Eren and colleagues (2018), Papadopoulos (2018) examined the effect of a preventive program on socio-emotional learning and mental health issues among gifted Kindergarten students. The study included 120 students aged 5-6 years, randomly assigned to intervention and control groups (N=60 each). The program focused on students' self-esteem and perception using an experimental design with repeated pretest-posttest measurements. Results showed a positive impact of the programme on increasing students' self-esteem for both genders. Whereas gifted boys exhibited higher achievement scores, the performance of gifted girls was lower, emphasising the need for targeted positive intervention programs to foster positive socio-emotional behaviours among gifted girls at an early age.

Additionally, research has shown that positive teacher-student relationships play a significant role in establishing positive learning outcomes and positive school environments for gifted and high-achieving students with diverse learning needs. Capern and Hammond (2014) investigated teacher behaviours that contributed to positive teacher-student relationships with gifted secondary students (N=58), and those with emotional/behavioural disorders (N=40) in Western Australia using a mixed-method approach. Findings specify that gifted students valued teacher behaviours that promoted amiable and affectionate interactions, supporting and enhancing their learning experiences. On the other hand, students with emotional/behavioural disorders valued teacher behaviours that showed endurance, warmth,

and understanding, acting as supportive precursors to learning. The comparison between the identified behaviours by the gifted and students with emotional disorders revealed a range of core behaviours that both groups considered indispensable in cultivating positive relationships, highlighting relevance for addressing the diverse learning needs of each group.

Research has consistently shown that both positive psychology and positive education focus on reinforcing individuals' strengths or competencies and growth rather than dwelling on victimhood (Suldo, Hearson, & Shaunessy-Derick, 2018). In a study conducted by Suldo and colleagues (2018) on gifted students in advanced placement and international baccalaureate programs, positive psychology was utilised to examine their mental health. Previous research suggested that gifted students in these accelerated programs experience higher stress levels than students in the regular classes, and they may be at greater risk for academic achievement-related issues though.

Findings from Suldo et al. (2018) contrasted with these initial assumptions, suggesting that positive psychology can promote a flourishing state of well-being among gifted students, leading to increased happiness with their school experiences. This state of well-being is influenced by both the support from families and the internal traits of the students themselves. Other findings revealed that gifted students with higher life satisfaction reported experiencing a more frequent state of flow, receiving ample support from their peers, and displaying more positive attitudes towards schooling. These students also reported having more satisfactory relationships with their teachers and academic programs. Therefore, providing positive emotional support and academic opportunities for gifted youth will not only contribute to their academic accomplishment but also enhance their feelings of pleasant happiness.

The above review of analysis has shown that gifted students are at risk regarding mental health disorders (Altay, Kilicarslan, & Yildiz, 2017). Suggesting that early age identification is essential and should be a gradual process, involving repeated opportunities for effective positive education support services (Lee et al., 2017). The importance of recognising giftedness early lies in the fact that it can help address potential issues, such as learning disabilities or socio-emotional challenges before they hinder academic and personal growth (Lee et al., 2017). Collaborative efforts involving parents and teachers are vital to

nurturing the future healthy functioning adults within a biopsychosocial domain. Fostering positive emotions and mental health well-being among both gifted and non-gifted can contribute to their high achievement and overall success in life.

Conclusion and Implication for Future Studies

In this study, we focused on reviewing multiple scholarly papers regarding positive education and positive psychology lenses on students' well-being and elevated attainment. We posed three research questions to focus on the review. First, the findings underline the endorsement of a comprehensive and holistic positive education approach, emphasising the relevance of addressing the distinctive requirements of students from diverse cultural and background contexts. The study emphasises the cultivation of students' resilience, competencies, and self-restorative mechanisms within the framework of positive education (Atlay et al., 2017; Duan et al., 2020), in particular with STEM gifted students (Margot & Kettler, 2019). The ultimate goal is to create a positive learning environment within schools, facilitating both the overall well-being of students and the enhancement of academic success.

Second, the results revealed that an association between well-being education and achievement exists (Adler, 2016; Clarke, 2020; Duan et al., 2020; Suldo et al., 2018). That is, the integration of positive psychology into STEM education, as demonstrated by the findings from this study, brings about a positive transformation in the lives of gifted students. By reducing distress, anxiety, depression, and concurrently enhancing self-confidence, positive psychology interventions contribute significantly to the overall well-being of gifted individuals. Drawing inspiration from Almukhambetova and Hernández-Torrano's (2020) and Wang, Moore, Roehrig, and Park (2011) work on positive psychology integration with STEM education not only benefits the academically gifted but also plays a crucial role in preventing underachievement, particularly among students from diverse background cultures.

This review underscores the potential of whole-school positive psychology-based interventions in enhancing students' mental health, self-esteem, and motivation, resulting in decreased dropout rates. This aligns with the broader research question, which explores how positive psychology-based interventions contribute to fostering positive

emotions and mental health among students. The evidence suggests that such interventions can promote flourishing in both academic and personal aspects, creating a supportive learning environment for students facing diverse challenges. The findings also reveal that early identification is pertinent for developing resilience and reversing underachievement (Ryckman & Peckham, 2015; Stoeger, Hopp, & Ziegler, 2017). This will assist in cultivating and activating early inward curative and defensive mechanisms.

Considering the five dimensions of the PERMA well-being model specifically relatedness, findings revealed that relationships are linked to teamwork and partnership among teachers, school staff, students, parents, family, local community members and entrepreneurs particularly for non-academic excellence endeavours (Lee et al., 2017). Overall, quality relationships, engagement, perseverance, creativity, and positive emotion appeared to be the strongest mechanisms for students' well-being (Adler, 2016; Coulombe et al., 2021; Duan et al., 2020; Suldo et al., 2018). These well-being facets are independently viable in cultural contexts outside high-income nations (Adler, 2016), although poor execution and monitoring, insufficient resources and inadequate teacher exposure may hinder progress (Humphrey et al., 2010). Positive well-being education has not only been shown to address students' emotional and mental health issues but also kindle their self-confidence to academic and nonacademic excellence (Alford, 2017).

Moreover, findings from this review also indicate that students are dissimilar with differing learning experiences and that relying on the integration of hedonic and eudaemonic well-being can enable total life functioning and gratification for outstanding accomplishment. Whereas students with advanced life gratification hold greater positive academic experiences towards flourishing, those with lower well-being are at higher risk of behavioural difficulties and school dropout.

Characteristics of positive psychology and understandings have shown that the concept is intended to enable individuals' cheerfulness toward progress. Nonetheless, this study's findings correlate with preceding papers about gifted students' socio-emotional health disorders and related effects including youth school dropouts, mental health disorders, and suicidal concerns. Drawing inferences from Christopher and Shewmaker's (2010) findings have shown high rates of psychological health maladies among students, and the gifted are no

exception. The authors proposed that frequent school dropouts and suicidal problems are likely to occur among children and youth. Teacher professionalism weaknesses in addressing gifted and other students' emotional learning needs require increasing worldwide attention. Despite these propositions, all students are unique with varying competencies, and support of quality relationships from both internal and external contextual environments is key (Adler, 2016; Cross & Cross, 2017; Suldo et al., 2018), to curtail mental sicknesses toward achievement and future adult life functioning.

Findings also disclosed that gifted boys perform highly amid depression and stressful conditions, although their frustrations, school dropout and suicidal levels are high. Unlike gifted boys, gifted girls perform low due to their high anxiety levels, likewise the normal intelligent or average students in addition experience lessening life functioning and satisfaction. Therefore, the general curriculum needs to be strengthened by addressing gifted students or youth's socio-emotional learning needs and psychological health conditions. Thus, injecting social-emotional learning needs support into the current gifted education programs (Cross & Cross, 2017; Zeidner & Matthews, 2017) is paramount.

Furthermore, an expectation of perfectionism from parents, and teachers on students also puts pressure on gifted students, but positive education can be a self-training concept, and if repeatedly practiced, will foster positive instructional classroom and school-community atmosphere by instilling a sense of growth and motivation (Cross & Cross, 2017; Schuler, 2002; Zeidner & Matthew, 2017). Rather than late identification, further findings unveiled that early identification of gifted students especially, gifted girls, will save society from incurring huge costs of maladjustment, future adult dysfunction, and dissatisfactory lives with suicidal, underachievement, and dropout concerns. Teacher exposure to gifted education is necessary. International attention and responsive support for positive relationships with parents, family, and community by which gifted adolescents' life satisfaction is tied to a relationship as a set of behaviours is necessary for addressing students' needs.

Additionally, early identification has shown that it can boost both gifted boys' and girls' self-confidence to participate in STEM disciplines particularly when the gifted envisage that the school cultural environment is unsupportive in promoting academic achievement

(Ryckman & Peckham, 2015), thereby accounting for students' underachievement (Dori et al., 2018; Reis & McCoach 2000). For Ryckman and Peckham (2015), while gifted girls attribute performance fiasco and lack of self-confidence to their inability to perform in STEM areas, gifted boys imagine missing peer pleasure and deliberately underperform, especially with late identification.

Other findings from this research denote that positive education holds correlations with accomplishment, well-being, health, and social relations for gifted and non-gifted individuals alike. Zeidner and Matthews (2017), Suldo et al., (2018), and other related studies supported this review that the gifted in general, are not emotionally vulnerable or dysfunctional; however, in every school, some gifted children and youth are experiencing emotional challenges and hardships, which impact negatively on gifted girls' attainment and socio-emotional dysfunction, coupled with frustration and depression amid gifted boys. As a consequence, remedial interventions need to increase specific programs, to focus on the gifted, non-gifted, and unidentified children and youths' aptitudes, which are indispensable (Cross & Cross, 2017; Högberg, 2019). Besides, the appropriateness of developing students' non-intellectual exceptional talents remains unnoticed, as disclosed in this review on musical talents (see also, Zeidner and Matthews, 2017; Lee et al., 2017), therefore, an increase of global attention is vital. This finding aligns with African nations and Ghana where STEM gifted students varied learning needs are ignored making them appear susceptible in the mainstream classrooms (Allotey, 2019, Allotey et al., 2020; Deku, 2013; Ngara, 2017).

Lastly, it is clear that high levels of grit and active approaches respond to academic pressure, and hopeful beliefs must connect to higher life satisfaction. However, some strong predictors of low life satisfaction do not only reveal maladaptive perfectionism but are also reliant on unsuccessful management of strategies with independently dealt issues and keeping problems to oneself (Clarke, 2020, see also, Suldo et al., 2018; Zeidner & Matthews, 2017), specifically, the high achieving individuals. Given this, educators need to identify and consider proactive strategies for intervening with children and youth who demonstrate these propensities. The potential consequence of students' cheerier effort may elevate youth and adults' resilience neural competencies equally. This current study including others supports the needed understanding of identifying and promoting student-level

resiliency protective abilities and skills; associated with youth happiness, which fortifies attributes by positioning students with no exception of the gifted and at-risk individuals toward decreasing contentment.

Future Research Direction in Positive Education

Understanding youth well-being education and its worldwide implications is central. This research has focused on theoretical literature from the perspectives of positive psychology to gain insightful acuities on the topic. The primary examination concentrated on the positive well-being of young individuals, both gifted and non-gifted, and their academic and non-academic achievements. Based on these findings, it is essential to highlight future research horizons to bridge the existing gaps.

Firstly, there is a need for more research on positive well-being education in developing nations precisely Africa, where little to no investigation has been conducted on positive education and gifted youth. This research should encompass schools at all levels and various types, from primary through universities, and include all students, such as high-achieving students, normal intelligent students, and those with learning difficulties. The PERMA-H well-being model can be measured to confirm or refute earlier studies.

Secondly, the role of positive school environments, positive communities, family, classmates, and parental participation in students' well-being and achievements should be highlighted (Coulombe, 2021; Suldo et al., 2018). Further research is needed to understand the impact of parental and family contributions on students' welfare and academic success. Comparative studies in this area should be conducted in African countries and other developed nations to replicate previous investigations.

Finally, there is a lack of compelling positive well-being intervention programs in STEM disciplines for gifted boys and girls, including normal intelligent students. Future research should aim to establish the benefits of positive education and mentally informed processes for educational practitioners, parents, community members, policy-makers, and other stakeholders in education. This will help replicate measures and mechanisms necessary to consistently determine the degree of individuals' 'resiliency restorative defensive guard'. Future research in positive education should focus on exploring positive well-being education in African nations and understanding the

impact of positive school environments and family involvement by establishing effective intervention programs in STEM disciplines.

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Alignment between the Intended and Enacted practical work component of the Senior High School Integrated Science Curriculum in the Kwadaso Municipality

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Abstract
A cursory observation of how Integrated Science Teachers (ISTs) operationalize the Senior High School Integrated Science Curriculum (SHSISC) reveals a neglect of the practical work component of the subject. Thus, this study sought to determine the extent of alignment between the intended and the enacted practical work components of the Senior High School Integrated Science Curriculum (SHSISC) in the Kwadaso Municipality. Sixty-four (64) lessons of eight (8) Integrated Science Teachers (ISTs) were observed using a Classroom Observation Schedule (COS). The data collected were analysed using frequency counts and percentages. The study found that enacted practical work component of the SHSISC was poorly aligned with the intended practical work. This misalignment has significant implications for Government's attempt to introduce a Standard-Based Curriculum in Senior High Schools (SHSs) in the Municipality. Furthermore, an extensive investigation into the causes of the misalignment is recommended.

Keywords: Intended curriculum; Enacted curriculum; curriculum alignment; Science Practical work

Background to the study

The performance of Senior High School candidates in the practical work component of Integrated Science Curriculum, including that in the Kwadaso Municipality, has been abysmal since the inception of the West African Secondary School Certificate Examination (WASSCE). Mismatch between the Intended and the Enacted practical work has been cited as a possible factor influencing the problem (Azure, 2016; WAEC, 2017).

The Intended Curriculum (IC) is described by Van den Akker (2003) as the standards set by curriculum developers in terms of what and how to teach, which is guided by curriculum materials such as textbooks and official syllabi. The Enacted Curriculum (EC), on the other hand, is the unique way and manner in which teachers present the curriculum to learners as they facilitate learning (Adentwi & Sarfo, 2009). To Webb (1997), Curriculum Alignment (CA) is the degree of match between the elements of two or more forms of curricula which facilitates the acquisition of knowledge and skills by learners. Explaining the meaning of science practical work (SPW), Blosser (1990) referred to it as an instructional practice where learners' knowledge and understanding are developed or improved through active exposure to hands-on activities by the learners instead of using other traditional approaches.

Ebru (2003) used teaching methods, instructional materials and facilities as the criteria for studying the alignment between the intended and the enacted Biology curriculum. Using a survey questionnaire and 685 Biology teachers, the study showed significant differences between the intended and the enacted Biology curriculum. In their study, Kurz et al. (2010) examined the alignment between the intended and enacted 8th-grade science curriculum for 18 teachers in Arizona State using the Survey of the Enacted Curriculum data collection instrument. Kurz et al.'s study revealed that alignment of the EC with the IC was low. Employing the mixed-methods approach, Seitz (2017) also examined alignment between the IC and the EC in Grade 9 Science curriculum in Canada using content and cognitive processes as a criterion of alignment. Similarly, Seitz found that CA between the IC and EC for the cognitive processes was low (7.3% alignment). In a more recent study, ZiebelL and Clarke (2018) also investigated the process of alignment between the IC and EC of Primary School Science in Victoria, Australia focusing on performance types of the learner

(knowledge, understanding, application, etc.). The study also revealed a wide gap between the curriculum standards and the EC.

It is noteworthy that the reviewed studies on Curriculum Alignment focused mainly on teaching methods, instructional materials, facilities, cognitive processes or performance types of learners with little attention on Science Practical Work (SPW). The current study examined the extent of alignment between the intended and enacted practical work component of the SHSISC using samples from the Kwadaso Municipality.

The performance of teachers on instructional practices has been noted to be a reliable indicator of the extent of match between IC and the EC (Hattingh & Rogan, 2007 & Schleicher, 2018). The performance of teachers on instructional practices describes how well Integrated Science teachers behave towards the Enacted Curriculum (Hattingh & Rogan, 2007). In this study, one variable will be investigated; that is, teachers' performance regarding practical work instructional practices in SHSs in the Municipality. The analysis of this variable will be used to determine the extent of alignment between the Intended and Enacted curriculum. Thus, the assumption is that the higher the performance of IST's practical work instructional practices the higher the extent of alignment between the enacted and the intended practical work. The study will, therefore, be driven by the research question; what is the extent of alignment between the Intended and Enacted practical work components of the SHSISC in Senior High Schools in the Kwadaso Municipality.

Literature Review

The Concept of Curriculum Alignment

The term "Curriculum Alignment" gained prominence after the publication of English's (as cited in March & Willis, 2007) book titled "Deciding what to teach and Test: Developing, aligning and auditing the curriculum". English defined Curriculum Alignment as "the degree of match or overlap among instruction, content and format of assessment" p. 89. Similarly, Webb (1997) defines Curriculum Alignment (CA) as the degree of match between the elements of two or more forms of curricula which facilitates the acquisition of knowledge and skills by learners. English (as cited in March & Willis, 2007) further emphasized that curriculum alignment seeks to achieve congruence

between the Intended and the Enacted Curriculum through the Assessed Curriculum. Supporting English's position, Leitzel and Vogler (1994) observed that curriculum is aligned if the delivery and assessment of the content are in accordance with the intended content. As Baker (2004) puts it; the best way to achieve a high degree of alignment is to start by analysing the intended curriculum and then develop teaching and assessments to match it. In the same token, a high degree of alignment among the various forms of curriculum improves students' learning (La Marca, Redfield, Winter & Despriet, 2001; Anderson, 2002 & Biggs, 2015). To add to this, curriculum alignment is a fundamental pillar in standards-based education (Näsström, 2008). Porter (2006) stated that to determine whether a system is indeed aligned, the instruction must be included in a study of alignment. It is based on Porter's (2006) position that this study made the Enacted Curriculum an important component of this Curriculum Alignment study.

Though Curriculum Alignment has been generally acknowledged as a means of ensuring effective implementation of curriculum, some researchers including Marsh (1993) have suggested that Curriculum Alignment has the tendency to reduce the autonomy of the teacher and his or her creativity. Besides, the adherence to the concept has been criticized as giving too much power to paper and pencil examination and leads the implementer of the curriculum to teach for examinations only (Marsh, 1993).

Methods for Determining Curriculum Alignment

A review of literature has unveiled four major models of analyzing Curriculum Alignment. According to Bennett (2005), the four models are; the Achieve model, the Webb's model, Survey of Enacted Curriculum (SEC) and the model recommended by the Council of Chief State School Officers in South Africa. It is the position of the researcher that understanding these models of Curriculum Alignment will enable him to establish a relevant criterion for investigating the level of alignment between the practical work component of the SHS Integrated Science curriculum and the Enacted Curriculum in the selected schools. According to Bennett (2005), the Achieve model is an approach that provides both qualitative and quantitative investigations using a panel of experts. These experts, who serve as panel judges, determine the degree of alignment using five criteria such

as: content centrality, performance centrality, challenge, balance, and range. Bhola (2000) as cited in Ziebell & Clarke 2018), however, has also categorized the models into three major groups; low, moderate, and high complexity models. The Low-level complexity models, according to Bhola, define the most basic alignment methods where alignment between the content of standards and other levels of curriculum are investigated to determine the level of agreement between them. This, in Bhola's view, is simply a correspondence of content and instruction.

An example of the High-level complexity model is the Webb's alignment method. Webb's model, which was originally developed by Norman Webb in 1997, provides a reliable set of procedures and criteria for conducting alignment studies. The model is based on expert judgment and quantified coding and analysis of curriculum standards and assessments. Per the structure of the Webb's model, it constitutes twelve criteria classified into five categories that examine both the breadth and depth of alignment between standards and assessments. The five categories are: content focus, articulation across grades and ages, equity and fairness, pedagogical implications and system applicability. The degree of alignment for each criterion is measured by one of three levels: full, acceptable, or insufficient. Webb's (1997) model is based on the underlying assumption that the enacted curriculum is aligned with standards and assessment (Bhola as cited in Ziebell & Clarke, 2018). Another example of the High-Level Complexity model is the Surveys of Enacted Curriculum (SEC) method. The SEC model involves the use of about four reviewers using a two-dimensional matrix to code standards, instruction, and assessment. The degree of alignment is analyzed from two dimensions; content topic and category of cognitive demand. The information contained within the content matrix may be converted into tables, graphical displays, and content maps to portray differences and similarities.

One of the limitations of Webb's (1997) model of alignment is that the focus is only on matching standards and assessments to the neglect of the Enacted Curriculum. Webb's assumption is that if the standards and assessments are aligned, the instruction or the enacted curriculum will also be aligned. However, in contrast to Webb's assumptions, Porter (2006) stated that to determine whether a system is indeed aligned, the instruction must be included in a study of alignment. It is based on Porter's (2006) recommendation that this study made the

Enacted Curriculum an important component of this Curriculum Alignment study.

In this study, the researcher adopted the low-level complexity model of assessing curriculum alignment. As described by Bhola (as cited in Ziebell & Clarke, 2018) a simple correspondence of content (practical work) of the standard and what is taught in class was determined. Using a rating scale, practical work instructional practices of Integrated Science teachers were observed. This model was adopted because it is less difficult to find a match between standards and other levels of curriculum in low-complexity models (Bhola as cited in Ziebell & Clarke, 2018). According to Bhola, the more complex models with specific criteria may be more likely to result in judgments of a lesser degree of alignment between the different forms of curricula.

The Concept of Science Practical Work

Science practical work has been given different definitions in different contexts, and even in the same environment different names have been assigned to them. Examples of such names are science practical work, lab work, experimental work, laboratory exercises and experiential learning (Kasiyo, 2017). Woolnough (1998), for instance, considers science practical work as the process of carrying out experiments with apparatus in the laboratory. Similarly, Tsai (2003) defines practical work as experiences of learners that are based in the laboratory. It is important to note that the definitions of Tsai (2003) and Woolnough (1998) suggest that science practical work can be carried out only in the science laboratory. These definitions, according to the researcher, is too restrictive suggesting that any hands-on activity that is carried out in the classroom or on the field should not be considered as a practical work activity. However, using the term "Experiential learning" Osborne (2003) defines practical work as a method of teaching where by knowledge is gained or developed by leading students to carry out hands-on activities instead of other traditional approaches. In the same token, Miller (2004) refers to science practical work as any activity which involves the manipulation of objects or materials being studied by students. Similarly, the Department of Basic Education, DBE (2011) of South Africa defines practical work as any activity which links concepts learned in class to actual practices in the surrounding environment. DBE (2011) gave more insight into the definition by emphasizing that practical work involves "hands-on" and

"minds-on" activities where learners develop their science process skills. It could be deduced from the definitions of Osborne, Miller and the DBE that the location of the practical work does not determine whether an activity is a practical work or not.

The effectiveness of a practical work has also been on the minds of educational researchers, including Miller (2004). On his part, Miller observes that in order to make practical work more effective, the teacher needs to take the students through three main stages. First, the teacher needs to make the objectives of the practical work clearly known to the students. Second, the actual practical work that needs to be done must be known to the students. Third, how the practical work will be carried out including its precautions should be planned and made known to the students. Supporting Miller, Kasiyo (2017) observed that practical work that is expected to promote the understanding of concepts and process skills needs to involve the students and understood by the students, in terms of its objectives and focus. According to Tyler (1949) "Learning takes place through the active behaviour of the student: it is what he does that he learns, not what the teacher does" (p.63*)*. When describing the use of microscope, for instance, Obeng (2001) recommended the direct involvement of students in the three main processes such as staining, mounting a slide and focusing a specimen to improve their understanding. More recently, Gupta (2020) has defined an effective practical work as that which leads to a change in the behaviours of learners. The revelations made by Miller (2004) and Kasiyo (2017), in the view of the researcher, should be taken serious by teachers. Their position points to the fact that it is not the practical work itself that is the only important thing but how they are presented to the students is also very significant if we want practical work activities to produce the needed results in students. This also emphasizes the need for teachers to involve students in the planning and integration of all practical work activities into Integrated Science lessons. However, according to Danso (2010), teachers in Ghana favour teacher-centered and knowledge-based teaching methods that leave little room for learners' participation. Kim and Tan (2011) also observed that science practical work is one of the most challenging tasks for science teachers. Teachers' reluctance in adopting practical work is due to lack of external support, limited time, large number of students, unavailability of resources, and the absence of trained laboratory assistants (Kim & Tan, 2011). Focusing on the significance of science practical work

Taraban, Box, CMyers, Pollard and Bowen (2007) stated that the continuous use of hands-on laboratory activities gave benefit to students to become more active, improve their knowledge, and enhanced their science process skills. However, the purpose of learning Science at an early stage is not to behave like a scientist, rather the purpose is to develop process skills, concepts and attitudes towards the subject which will enable students to cope effectively with education and achievements at the tertiary level (Sadhana, 2017).

In their Theoretical Model for Science Practical work Ausubel, Novak and Elton (2001) as cited in Bradley (2005) identified eight (8) types of practical work as Directed Activity, Demonstrations, Skill development, Laboratory experiments, Undirected Activity, Open enquiry/problem-solving, Directed Inquiry/Problem Solving and Creative Feedback. Bradley (2005) explained each of the types of practical work as follows:

Directed Activity

This type of practical work is teacher-directed activity in which the students, after following the directions of the teacher, observe an activity, record key variables and use them to describe what is learned mostly by using a workbook.

Demonstrations

Demonstrations take place when students gain knowledge or skills by observing a practical work activity being carried out by a teacher or an expert in the classroom, laboratory or field. The discussions that follows this activity helps the learner to assimilate and make real meaning from the activity. Though a demonstration does not readily promote students' independent discovery, it helps to improve it when demonstrations are done very often. Gupta (2020) also observed that among the various types of practical work, demonstrations are used by teachers in most cases due to the large class sizes that is normally found in schools.

Skill development

Practical work activities that are described as "skill development" are activities carried out by learners to help them to acquire manipulative and process skills. However, the learning of procedural skills in science practical work has recently been a declaration of intention with few

examples of successful implementation (Niedderer, 2002). This appears to confirm the point that textbook is the curriculum for science and hence what passed as the teaching of science was nothing more than information-giving by teachers and memorization of the information by students (Collison & Aidoo-Taylor, 1990).While the manipulative skills involves the correct and safe use of laboratory equipment, the process skills are the skills such as observation, measuring, classifying etc. that helps scientists or the students to carry out experiments and other practical-related activities. According to Bradley (2005), both the manipulative skills and the science process skills are not independent of content. That is, a students can only learn how to practically measure dimensions of objects on the shoulders of concepts like "Measurement". The Senior High School Integrated Science Syllabus (2010) of the Ghana Education Service has identified nine intended basic science process skills to be taught in Senior High Schools. These are Observation, Manipulation, Classification, Drawing, Designing, Measuring, Recording, Reporting and Conduct in laboratory or field. In this study, the perceptions of Integrated Science teachers and students on the extent to which Integrated Science teachers assist students to carry out practical work will be based on 18 items related to these nine (9) sciences processes skills.

Laboratory experiment

These are practical work activities carried out by students, based on specific guidelines provided by the teacher, to verify scientific principles, facts or concepts and facts that students have had the privilege to study. With this kind of practical work, students have no input with regards to how they are carried out. Normally, the key steps to be followed by students are the aim of experiment, materials needed, procedure, results and conclusions. Usually, the teacher directs students to present a report about the experiment after the practical work. This type of practical work is a teacher-centered type of practical work which leaves little room for students to construct their own knowledge (Bradley, 2005).

Undirected Activity

These are practical activities, such as, play, trial and error and simple problem-solving activities that are initiated by the students themselves, based on the idea that play is an important way of learning. When

students direct activities of the practical work, it promotes the stimulation of questions which may lead to the planning and execution of further practical activities. Bradley (2005) has observed that if students, in the process of carrying out the activity, try to learn something or concepts that are not acceptable in the society, students will be discouraged from learning it.

Open inquiry or problem solving

Sometimes students pose questions to which they expect answers to help them understand concepts well and to satisfy their curiosity. Open inquiry is a practical work activity planned and implemented by students to answer this type of question. As far as its importance is concerned, Bradley (2005) observed that the activity promote students' understanding of concepts through their experiences.

Like other African countries, the Ghana Education Service attaches importance to practical work in science education. This is because practical work is emphasized by the NaCCA in all the science syllabuses, including Integrated Science, to help students attain knowledge and develop practical skills (Ghartey-Ampiah, Tufuor & Gadzekpo 2004). Besides, practical work is examined externally by WAEC in the paper 3 of the Integrated Science WASSCE.

In this study, the term 'Science Practical Work' will be adopted and will be used to refer to any instructional practice where learners' knowledge, understanding and skills are developed or improved through active exposure to hands-on activities by the learners instead of using other traditional approaches. Besides, the observation of teachers' practical work instructional practices in the schools will focus on practical activities related to four types of practical work as described by Bradley (2005). They are directed activity, demonstrations, skill development and laboratory experiment. This is because these are the type of practical activities that could be inferred from the Senior High School Integrated Science curriculum (2010).

Methodology

Research Design

This study employed the cross-sectional survey design. Survey design was chosen because the study intends to generalize its outcome from a sample to the population so that inferences can be made about key

characteristics of the population (Babbie, 2009). The cross-sectional design was also adopted because the study was meant to find out the overall 'picture' or prevalence of the key variable of the study by taking a cross-section of the data at a particular academic year.

Population

The study was carried out in the Kwadaso Municipality in the Ashanti Region of Ghana. In this study the target population was all the 64 Integrated Science teachers (ISTs) in the four (4) government-assisted SHSs in the Kwadaso Municipality. These participants were chosen because they are major agents in the Integrated Science (IS) curriculum implementation process. The accessible population was the 52 ISTs in Prempeh College, Yaa Asantewaa Senior High School (High-performing schools), Agric Nzema Senior High School and Methodist Technical School (Low-performing schools) during the 2019/2020 academic year.

Sample and sampling procedure

In this study, all the four (4) government-assisted SHSs in the Kwadaso Municipality were purposively selected for the study. In order to observe the practical work instructional practices in the schools, two (2) Integrated Science teachers were randomly selected from each of the four schools. In order to select the two teachers from each of the schools, a sampling frame was developed for each school by writing the names of the Integrated Science teachers on paper. The lottery method was used to select two Integrated Science teachers from the sampling frame of each school. Hence, practical work instructional practices of eight (8) Integrated Science teachers in sixty-four (64) lessons were observed in the classrooms of the four schools. "For content-independent dimensions of instructions, the observation of one lesson per teacher per class was sufficient to reach sufficient reliability levels" (Mikeska, Holtzman, McCaffrey, Liu, & Shattuck, 2018; p. 36). So, since the focus of observation was on the pedagogical dimension of the Enacted practical work, observing eight (8) lessons per teacher could produce reliable data. Again, since the number of schools involved in this study were four and equal number of teachers were expected to be selected from each of them, eight (8) Integrated Science teachers were the most appropriate sample for the classroom observations.

Instrument for Data Collection

The structured, non-participant and direct observation models of observation were adopted for the study. These models were adopted because while non-participant observation minimized interruptions of the usual classroom teaching practices of the teachers, the direct observation provided an opportunity to provide a record of real practical work activities in their natural classroom environment. On behalf of the World Bank Group, Rogers (2015) assessed teacher performance and skills by using observation as one of the key data collection instruments. Also, during one of their formative evaluation processes, the Chesterfield County Public Schools of Virginia, U.S.A (2019) adopted observation as a data collection method for assessing the performance of teachers in the schools.

The Staffordshire University Guidelines for the Observation of Science Teaching Practices (rating scale) was adapted to measure the performances of Integrated Science teachers regarding practical work instructional practices in the schools. Out of the 31 items of the original scale, 23 which were related to practical work activities were extracted and used for the instrument. For the purposes of this study, the scale was renamed as "Classroom Observation Schedule". All the 23 items of the scale were positive four-point Likert-type statements which have been grouped into five, measuring five sub-dimensions of teachers' practical work instructional practices. The first four items (1, 2, 3 and 4) measure the "Organization of practical work", the next seven items (items 5, 6, 7, 8, 9, 10 and 11) measure the "presentation of practical work", items 12 to 17 measure the "level of interaction", items 18 to 21 measure the "content knowledge" sub-dimension and the last two items (22 and 23) measure the "Cognitive demand on the students". All the scale points of the 23 items were labelled, ranging from 1 ("Not observed"), 2 ("Low"), 3 ("Moderately High") to 4 (High"). In this study, the scale points were named as performance categories with the following definitions:

- "Not Observed" means the listed behaviour was not demonstrated.
- "Low" means the science teacher showed little or no planning for its execution.
- "Moderately High" means the teacher showed some level of planning for its implementation.

- "High" means the teacher showed careful planning and classroom flexibility in its implementation.

For each of the dimensions, a blank space was provided for "Other Comments" to record additional detailed information about teacher's practical work activities in the classrooms.

Validity of Instrument

The instrument was reviewed by Heads of Science Department of two of the Senior High Schools. The wording of the items of the instrument was, therefore, revised according to their comments and suggestions. It was pre-tested by observing eight Integrated Science lessons at Ejuraman, a Senior High School in the Ejura-Sekyedumase Municipality.

Reliability of Instrument

Using SPSS version 21, the Cronbach alpha coefficient for the 23 items was determined as 0.79, representing as an acceptable internal consistency reliability of the instrument. An alpha coefficient of 0.7 is regarded as acceptable threshold for reliability (Nunnally as cited in Ary et al., 2010). This scale was used in this study because the focus of the items is also in line with key elements of the guidelines written in the National Teachers' Standards for Ghana which is part of the curriculum package of the Ghana Education Service.

Data Collection Procedure

Observations were conducted randomly during the regular school contact hours based on the time table of the eight selected teachers in the schools. Observations made in the classrooms for the first two lessons of each teacher were not recorded, the period was meant to establish a good working rapport with the teachers and the learners. If a lesson was not integrated with a practical work, each of the 23 items on the schedule would score 1 ("Note Observed"). If a lesson was integrated with practical work, each of the 23 items was scored either 2 ("Low"), 3 ("Moderately High") or 4 ("High"). To determine the reliability of data collected from the observations, each observation was video-recorded and subsequently given to the Head of Integrated Science of Prempeh College for him to rate the performance of the teachers. However, one of the Integrated Science teachers did not allow the researchers to take videos of his lessons due to personal

reasons. The Cohen's Kappa coefficient (k) was, therefore, calculated for the remaining fifty-six (56) observations using the formula:

Cohen's Kappa coefficient (k) = $\frac{P_0 - P_e}{1 - P_e}$

Where P_o = Relative observed agreement between raters
$\qquad P_e$ = Hypothetical probability of chance agreement

The Cohen's Kappa Statistic was 0.94 representing a satisfactory rating agreement between the researcher and the Head of the Integrated Science Department.

Data Analysis

The number of items (23) on the classroom Observation Schedule (COS) and the number of Integrated Science lessons observed (64) yielded a total cumulative frequency score of 1472 (That is, 64 observations x 23 items). In his work "The Perceptions of Adolescents of their Career Guidance and Counselling Needs …", Ocansey (1994) used both the number of items and scale values to yield a total score for each respondent from a symmetrically distributed population. To determine the performance of the ISTs on practical work instructional practices, three main stages were followed: First, the item by item frequency score for each of the four performance categories ("Not Observed", "Low", "Moderately High" and "High") were determined using SPSS version 21. Secondly, the cumulative frequency for each performance category was determined by adding the frequencies of the individual items in the scale. Thirdly, the percentage cumulative frequency for each performance category was determined by dividing the cumulative frequency of each performance category by the total cumulative frequency (1472) and multiplied by 100. Thus, each of the performance categories obtained a percentage cumulative frequency score which determined the performance of Integrated Science Teachers (ISTs) regarding practical work instructional practices in the four schools. These percentages were used to plot a bar graph using Microsoft Excel. For Likert-type scale data that are ordinal in nature, the mode is the most suitable statistics to use for easy interpretation and display of observation in a bar chart (McLeaod, 2019).

On the basis of the percentage cumulative frequencies of the individual performance categories, a decision was made as to whether the practical work instructional practices in the schools were aligned with the standard or not. If the sum of the percentage cumulative

frequencies of the "Moderately High" and the "High" fell below 50% of the total cumulative frequency (1472), the enacted practical work was considered to be poorly aligned with the intended practical work. On the other hand, if the sum of the percentage cumulative frequencies of the "Moderately High" and the "High" options equals or is above 50% of the total cumulative frequency, the performance of ISTs regarding practical work instructional practices was deemed to be high. That is, the enacted practical work was considered to be highly aligned with the intended practical work. In his work "Curriculum Alignment among the Intended, Enacted and Assessed Curricula for Grade 9 Science", Seitz (2017) considered a percentage alignment index close to or equal to 100% as full or high curriculum alignment among the intended and enacted curriculum.

Ethical Consideration
An introductory letter was used to seek permission from the Heads of the schools selected for the study. Teachers' anonymities were protected by using a coded number system for the observational schedule. Again, all other identification information such as name of school, etc. were not part of the schedule.

Results of the Study
Figure 1 presents the performance of the Integrated Science teachers regarding their practical work instructional practices.
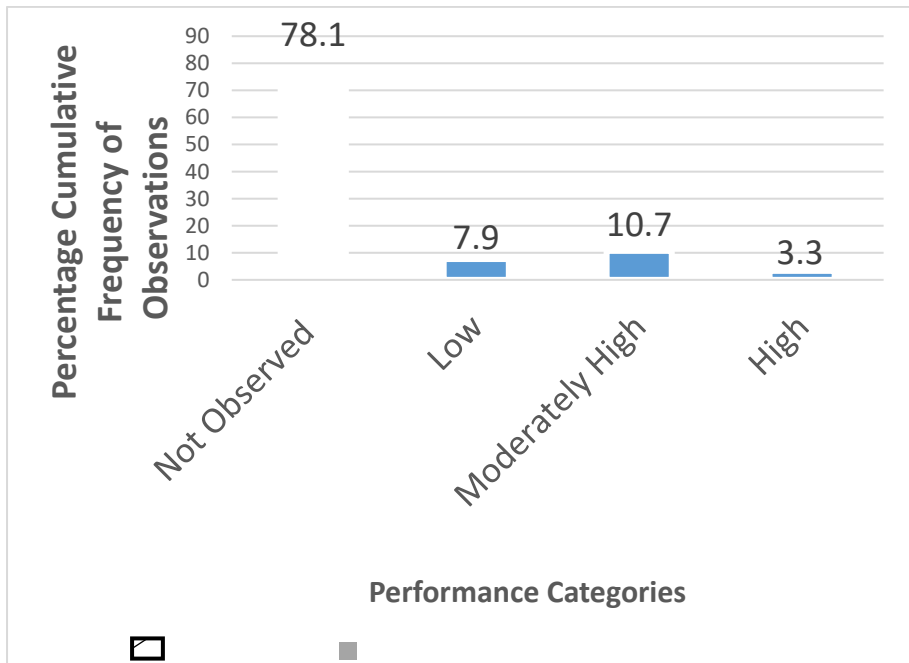
Figure 1: Teachers' performance regarding practical work instructional practices.

As shown in Figure 1, the result shows that the practical work component of the enacted Integrated Science Curriculum was poorly aligned with the intended practical work component of the curriculum. This is because the performance of ISTs with respect to practical work instructional practices was very low. That is, the sum of the percentage cumulative frequencies (14.0%) of the positive performance categories ("Moderately High" and the "High") fell below 50% of the total commutative frequency of 1472. It is also noteworthy that there is a very wide difference (86%-14%= 72%) between the sum of the percentage cumulative frequencies of the negative performance categories ("Not observed" and "Low") and that of the positive performance categories ("Moderately high" and High"). Further, the performance category that recorded the highest percentage cumulative frequency (78.1%) was in respect of the "Not observed" performance category. As was expected, the performance category, "High", recorded the least percentage cumulative frequency of 3.3%. These results suggest that either most of the Integrated Science lessons were not integrated with practical activities or the practical work integrated in

these lessons were poorly carried out. A more detailed results, based on the five sub-dimensions of the construct, have been presented in Table 1.

Table 1 Distribution of the Performance of Teachers' Practical work Instructional Practices based on the five dimensions

Teachers' Instructional Characteristics	Performance Level				
	Not observed	Low	Moderately. High	High	Total
Organization of practical work	208 (81.3%)	18 (7.0%)	16 (6.3%)	14 (5.5%)	256 (100%)
Presentation of practical work	348 (77.7%)	49 (10.9%)	39 (8.7%)	12 (2.7%)	448 (100%)
Interaction with students	300 (78.1%)	24 (6.3%)	44 (11.5%)	16 (4.2%)	384 (100%)
Content Knowledge	196 (76.5%)	17 (6.6%)	39 (15.2%)	4 (1.6%)	256 (100%)
Cognitive Demand of practical work on students	98 (76.6%)	8 (6.3%)	20 (15.6%)	2 (1.5%)	128 (100%)
Total	**1150 (78.1%)**	**116 (7.9%)**	**158 (10.7%)**	**48** **(3.3%)**	**1472 (100%)**

Note: The figures are row frequencies and row percentages

Another dimension of the results that needs further reflection is the performance of the ISTs regarding the individual sub-dimensions of the construct. It is interesting to note that none of the five sub-dimensions of practical work instructional practices of the ISTs was highly rated. That is, the sum of the percentage cumulative frequencies of the positive performance categories for all the five sub-dimensions;

Organization of practical work (11.8%), Presentation of practical work (11.4%), Interaction with students (15.7%), Teachers' content knowledge (16.8%) and Cognitive demand of practical work on students (17%) were below 50% of the total commutative frequency of 1472. This means that most of the elements under each of the dimensions were either poorly carried out or were not carried out at all. Teachers' commitments towards the various types of practical work carried out in the schools have been presented in Table 2.

Table 2 Frequency distribution of Types of practical work Carried out in the schools

Category of School	Directed Activity	Demonstrations	Skill Development	Laboratory Experiment	Total
High-performing schools	2 (28.6%)	4 (57.1%)	1 (14.3%)	Nil (0.0%)	7
Low-performing schools	Nil (0.0%)	6 (75%)	1 (12.5%)	1 (12.5%)	8
TOTAL	2 (13.3%)	10 (66.7%)	2 (13.4%)	1 (6.6%)	15 (100%)

Table 2 shows that only a few (15; 23.4%) of the IS lessons were integrated with practical work. Besides, most of the practical work carried out in the schools (66.7%) were in the form of "demonstrations" which were carried out by the Integrated Science teachers themselves instead of the students.

Discussion of Results

The results of the study revealed that the enacted practical work component of the SHSISC was poorly aligned with the intended practical work component of the curriculum. This misalignment confirms Niedderer's (2002) position when he observed that the learning of procedural skills in science practical work is merely a declaration of intention with few examples of successful implementation.

Curriculum over-load and its accompanying limited time-factor may explain this outcome. In accordance with the Senior High School Integrated Science syllabus, ISTs are expected to teach fifty (50) topics within just six (6) semesters. Holidays, days for sporting activities ("Inter-school" and "Inter-house competitions") and the organization of other unplanned events further reduce the contact hours meant for academic work. The fact is that practical work, unlike the lecture-method, demands a lot of time. So, the limited time available and the large number of topics to be taught must have practically discouraged the ISTs from implementing the intended practical work in their lessons.   Based on ZiebelL and Clarke's (2018) assertion, the inadequate practical work in the schools could also be attributed to Integrated Science teachers' inability to follow and properly interpret instructional guidelines in the Integrated Science curriculum. The interpretation of the intended objectives of a curriculum at the classroom level is a difficult, complex and dynamic process (ZiebelL & Clarke, 2018).

Another important factor that could have influenced the result is the dependence on past questions for instructional practices. According to Elliott et al. (2010), one critical requirement for the achievement of higher alignment between the intended and enacted curriculum is the extent of agreement between the two components of the educational environment- curriculum and assessment. It can, therefore, be deduced from the above that if the assessed curriculum (Internal or external examination) is not aligned with the intended practical work outlined in the syllabus, teachers and students will not be motivated to respectively teach and learn the contents of the intended curriculum as they are expected to do. Since the inception of the SHS programme the practical work component of Integrated Science (IS) of the West African Senior School Certificate Examination (WASSCE) has never been based on hands-on practical work involving real objects or materials (Personal observation). So, contrary to what is done for students offering science as an elective subject, no laboratory equipment, tools or specimens are brought to the examination hall for the purposes of assessing students in the practical aspect of IS. Instead, the WASSCE papers on IS focus only on the "teacher-directed activity" type of practical work, neglecting other types that are more student-centred. That is, diagrams of equipment, items or set-ups are normally drawn on paper for students to answer questions on them. So, if students

are assessed by using diagrams on paper, then they and their teachers will be motivated to only rely on textbooks or workbooks for their practical work instead of carrying out hands-on activities using real specimen. This, among other reasons, may have contributed to the poor alignment between the intended and the enacted practical work component of IS curriculum.

The marks allocated to the practical work aspect of the Integrated Science WASSCE could also be a contributory factor to the seemingly lack of interest in science practical work in the schools. The maximum marks or score allocated to the practical work component of the Integrated Science WASSCE papers each year is only 15%. These marks, in the view of the authors, is inadequate and hence, not motivating enough. Interestingly, the examiners who mark these scripts are also the Integrated Science teachers who are expected to teach the practical work in the schools. Hence, they could not consider the marks as motivating enough to spend enough time to carry out practical work in the schools as outlined in the curriculum.

One element of the results that also needs further reflection is the use of "Demonstrations" as the most frequently carried out type of practical work during Integrated Science lessons in the selected schools. That is, among the fifteen (15) Integrated Science lessons that were integrated with practical work, the practical work in ten (10) of the lessons were in the form of "demonstrations". According to Bradley (2005), demonstration is a type of practical work activity in which an individual (normally, the teacher himself) carries out the practical work for the students to observe. That is, students are expected to learn concepts and process skills by making meaning from the practical work being carried out by the teacher or an expert. In Bradley's view, demonstrations are the least learner-centered type of practical activity since it is normally carried by the teacher himself. This finding tallies with the claim by Gupta (2020) that teachers use demonstrations for most of their practical work activities with their students. Large class size, according to Gupta, influenced the choice of the teachers.

Factors that could explain this finding are numerous. First, demonstrations can be carried out within the shorter period. It avoids the extra time that will be needed to assemble apparatus for all students in the laboratory to carry out their practical activities. Gupta (2020) observed that the choice of what kind of practical work depends on the time and resource constraints. So, since it takes a shorter period to carry

out demonstrations in schools, Integrated Science teachers preferred demonstrations to the other types of practical work activities. Second, because it is normally performed by the teacher the students do not handle the equipment and hence avoid the risk of a student damaging the equipment. In this sense, demonstrations help to protect and increase the lifespan of laboratory equipment. This, probably, could be one of the reasons why the Integrated Science teachers in the selected schools were comfortable with demonstrations as compared to other types of practical work activities. Third, carrying out demonstrations is relatively cheaper as compared to other forms of practical work. That is, demonstrations require relatively fewer apparatuses and materials for practical lessons since only one person is undertaking the exercise. So, due to it cost effectiveness to the Science Department and the school as whole demonstrations were adopted as the most preferred form of practical work in the selected schools in the Kwadaso Municipality.

The outcome of this study has a number of instructional, managerial and research implications. To begin with, the misalignment defeats the essence of the practical work outlined in the curriculum. This is because the practical work activities in the curriculum were meant to help the learner to develop its science process skills and facilitate the understanding of concepts. So, if these practical activities are not implemented in the schools as planned then their documentation in the curriculum is of no relevance to the students. It could also be inferred from the results that SHS students in the Municipality will continue to have unsatisfactory academic performance in the practical aspect of the subject if this inadequacy in practical work activities persists. This is because a high degree of alignment among the various forms of curriculum improves students' learning (La Marca et al., 2001; Anderson, 2002).

These results also have serious implications for the efforts of the Education Directorate of the Kwadaso Municipality at implementing the new Standard-Based curriculum in SHSs in the Municipality. This is because curriculum alignment is a fundamental pillar in Standards-Based education (Näsström, 2008). According to Ghana's Pre-tertiary Education Curriculum Framework (2018), the learning of critical thinking and problem-solving skills are the primary competences expected to be fostered in learners under the new Standards-Based curriculum. Based on the outcome of this study, the achievement of this goal is likely to suffer in SHSs in the Kwadaso

Municipality if the new curriculum is implemented. This has also given educational authorities the empirical evidence that the effective implementation of the curriculum in SHSs in the Municipality is likely to fail.

The outcome of this study also has significant implications for the monitoring role of the authorities of the schools and the Education Directorate of the Municipality. The Headmasters, through the Assistant Headmasters in charge of academic work, must continuously monitor Integrated Science lessons in their respective schools to ensure that practical work activities play a central role in the teaching strategies adopted by teachers. This can be achieved by allocating specific time on the schools' timetable exclusively for science practical work activities.

Limitations of the Study

The schools used for the study were public Senior High Schools selected from only the Kwadaso Municipality. Hence, conclusions of the study are limited by these schools. Secondly, since the data were collected with attitudinal scale, the problem of bias normally associated with the use of scales cannot be ruled out completely.

Conclusions

Comparing the intended and enacted practical work component of the SHS Integrated Science curriculum is an innovative idea that can provide some insight into the way the curriculum works in Senior High Schools in the Kwadaso Municipality. This study provided evidence of a misalignment of the intended with the enacted practical work component of the SHS Integrated Science curriculum. It has also confirmed that Integrated Science teachers in the selected schools do not often use practical work as a means of instruction during Integrated Science lessons. More alarmingly, the teachers mostly rely on teacher-cantered type of practical work in the few practical work activities carried out in the schools. These findings could possibly inform officials of the Education Directorate, school authorities and Integrated Science teachers to ensure that science practical work is given the needed attention as stipulated in the Integrated Science curriculum.

Recommendations

Based on the conclusions of this study, the following recommendations are made for consideration:

1. The Kwadaso Municipal Education Directorate should ensure the effective enactment of Integrated Science practical work in Senior High Schools by making the syllabus available to all teachers and students, organizing in-service training for science teachers, providing educational materials for science practical work and instituting quality control mechanisms in the form of monitoring and supervision and follow-up activities.

2. The management of the Senior High Schools in the Municipality should put measures in place to effectively integrate practical work into Integrated Science lessons in Senior High Schools. This can be done by allocating time on the timetable exclusively for Integrated Science practical work with improved duration to allow teachers to work at their own pace.

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Basic School Teachers' Attitude and Confidence Level in Teaching the Computing Common-Core Programme Curriculum in Ghana

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ABSTRACT

This study investigates the attitudes and confidence levels of Basic 7-9 teachers in Ghana regarding the implementation of the Computing Common Core Programme (CCP) curriculum. Utilizing Rogers' Diffusion of Innovations Theory as a framework, the research explores factors influencing teacher confidence, including access to ICT resources and professional development opportunities. A descriptive survey design was employed, involving 287 teachers from public schools across Ghana. The findings reveal a high level of teacher confidence in teaching the CCP curriculum, despite limited access to ICT tools and resources. A positive, albeit insignificant, correlation was found between ICT resource availability and teacher confidence. However, professional development avenues significantly impact teacher confidence, aligning with Rogers' theory on the role of communication channels and social systems in the diffusion of innovation. The study recommends prioritizing the provision of ICT tools in schools and expanding professional development opportunities for teachers to ensure the successful implementation of the CCP curriculum.

Keywords: Teacher Attitudes, Teacher Confidence, Computing Common Core Programme, ICT resources, Diffusion of Innovations Theory

Introduction

The integration of Information and Communications Technology (ICT) into school curricula has been a global trend in recent decades, driven by the recognition that digital literacy is a crucial skill for success in the 21st-century workforce. The Computing Common Core Programme which aims to equip students with fundamental computing knowledge and skills, has been adopted by many education systems around the world, including Ghana. However, the effective implementation of such ICT-focused curricula largely depends on the attitudes and confidence levels of the teachers tasked with delivering this content. Globally, studies have shown that teachers' perceptions and self-efficacy in teaching ICT subjects can vary significantly. Some educators exhibit high levels of enthusiasm and confidence, readily embracing the integration of technology in their classrooms (Ertmer & Ottenbreit-Leftwich, 2010; Tondeur et al., 2017). Others, however, may feel apprehensive or underprepared, which can hamper their ability to effectively teach ICT-related topics (Teo, 2008; Voogt, 2010).

In the Ghanaian context, the integration of ICT into the national curriculum has been a gradual process, with varying levels of success. While the government has made efforts to improve ICT infrastructure and teacher training, challenges remain in ensuring that all teachers feel confident and equipped to deliver the Computing Common Core Programme effectively. Existing research suggests that some Ghanaian teachers may lack the necessary digital skills, pedagogical knowledge, or access to resources, leading to uncertainties and hesitance in teaching ICT subjects (Buabeng-Andoh, 2012; Boakye & Banini, 2008; Agyei & Voogt, 2011).

This paper aims to explore the attitudes and confidence levels of basic school teachers in Ghana as they navigate the implementation of the Computing Common Core Programme. By understanding the perspectives and experiences of these educators, policymakers and educational stakeholders we can identify areas for improvement and develop targeted interventions to support teachers in effectively delivering ICT-focused curricula.

ICT as a Tool in the Classroom

The integration of Information and Communications Technology (ICT) into classroom instruction has become increasingly prevalent in recent years. ICT can serve as a powerful tool to enhance the teaching and learning process, providing teachers and students with a wide range of opportunities and capabilities. At its core, ICT can be utilized as a versatile instructional tool in the classroom. Digital technologies, such as computers, tablets, interactive whiteboards, and educational software, can be leveraged to present content, facilitate interactive learning activities, and enable more personalized and engaging learning experiences (Tondeur et al., 2017; Hew & Brush, 2007). For instance, teachers can use presentation software to create dynamic, multimedia-rich lessons, or incorporate educational applications and simulations to help students better visualize and comprehend complex concepts.

Furthermore, ICT can facilitate more collaborative and student-centered learning. Collaborative tools, such as online document editors, discussion forums, and virtual learning environments, can enable students to work together on projects, share ideas, and receive feedback from their peers and teachers (Ertmer & Ottenbreit-Leftwich, 2010; Hermans et al., 2008). This can foster the development of essential 21st-century skills, such as communication, critical thinking, and problem-solving. The use of ICT in the classroom also has the potential to provide teachers with valuable data and insights to inform their instructional practices. Learning management systems, assessment tools, and data analytics can help teachers track student progress, identify areas of difficulty, and personalize learning experiences accordingly (Wastiau et al., 2013).

However, the effective integration of ICT in the classroom is not without its challenges. Factors such as teacher digital competence, access to technology, and institutional support can significantly influence the successful implementation of ICT-enabled teaching and learning (Buabeng-Andoh, 2012; Agyei & Voogt, 2011). Ongoing professional development and the provision of adequate resources are crucial to empowering teachers to leverage ICT as a transformative tool in the classroom.

ICT as a Subject in Basic Schools

      Computing is studied as a subject in Ghanaian Basic Schools. At Early Grade (B1-B3) it is embedded in the "Our World, Our People" curriculum and it is a standalone subject in Upper Primary (B4-B6), B7-B9 (Junior High School) and B10-B12 (Senior High School). Assessment strategies including Assessment *for* Learning, Assessment *as* Learning and Assessment *of* Learning are expected to be adopted to help learners achieve learning outcomes. The following sub-strands are found in the B1-B3 (Our World Our People) curriculum: Introduction to Computing, Sources of Information and Technology in Communication (National Council for Curriculum and Assessment, 2021). At the Upper Primary, 21 different sub-strands are found under the following headings: Introduction to computing, presentation, word processing, desktop publishing, programming and databases, internet and social media and finally health and safety in using ICT tools. In the Computing Common Core Programme curriculum, 15 sub-strands are presented including the following: components of computers and computer systems, health and safety in using ICT tools, introduction to word processing, introduction to presentation, desktop publishing and electronic spreadsheets. In addition, computer networks, internet and social media, information security and web technologies are taught under communication networks. The final strand – computational thinking has these sub-strands: introduction to programming, algorithm, robotics and artificial intelligence (National Council for Curriculum and Assessment, 2021). The Computing curriculum aims at helping learners to acquire basic ICT literacy and communicate effectively using ICT tools. It is also aimed at developing learners' interest and skills in the use of the internet, develop their ethics in using ICT tools and finally acquiring programming and database skills. It is expected that, after learners have gone through a period of instruction, a body of skills known as, core competencies, are expected to be developed in learners. The core competencies include critical thinking and problem solving, creativity and innovation, communication and collaboration, cultural identity and global citizenship, personal development and leadership and digital literacy (NaCCA, 2020). The curriculum for the Senior High School has two stands. It is in the draft format and is now being trialed before final approval for deployment in 2024 academic year.

The need to Study ICT versus the Acquisition of 21st Century Skills

Learning computing provides the opportunity for learners to develop essential skills and competencies and motivates them to become flexible problem solvers and lifelong learners. In the 21st century, the possession of problem-solving and decision-making skills is an essential pre-requisite and these are acquired in the learning of computing. In an increasingly technological age, the possession of problem-solving and decision-making skills is an essential pre-requisite and these are acquired in the learning of computing. This makes the study of ICT as a subject essential if the slogan *"Our dream Ghanaian Child"* is to be attained. The core competencies envisaged by the 2019/2020 curriculum reforms in Ghana include global citizenship, innovation, critical thinking, problem solving, teamwork, good communication etc. The core competencies enshrined in the Basic School curriculum are carefully selected, to among other things, ensure learners' acquisition of 21st Century skills which comprise skills, abilities, and learning dispositions that have been identified as being required for success in 21st century society. These include critical thinking and problem solving, creativity and innovation, communication and collaboration, digital literacy etc. (National Council for Curriculum and Assessment, 2021). To achieve this, teachers must use multimodal content, hands-on training, interactive, collaborative and nonlinear methods of teaching (Murugesan, 2021). A 21st century teacher's role includes planning, instructing, delivering lessons and assessing student learning. Teachers will require a positive attitude towards teaching to be able to meet this expectation.

Teachers' Attitude and Confidence in Teaching Computing

Thura and Khaing (2020) believe that the attitude of teachers is an important aspect which determines the perception, and realization of the objectives and goals of a curriculum. Thura and Khaing observed that most teachers have positive attitudes with respect to new curriculum. Ponte et al. (1994) also found that teachers wanted to have a much greater level of participation in the processes of implementing new curriculum. In evaluating teachers' attitude towards curriculum reforms, Jeder (2013) found *criticism, negative attitudes* towards certain components such as: the lack of a real dialogue with the practitioners in the dynamic of the curriculum reform and of the proposed changes. Other issues identified included "unjustified

disappearance" of some disciplines of study, the lack of agreement between some disciplines and manuals with high levels of abstraction. Again, students' cognitive level, the mismatch of some programs and the volume of the proposed contents with the number of hours allocated to their study were some of the issues raised.

Areekkuzhiyil (2014), in a study on attitude of teachers towards curriculum reform at undergraduate level, found that teachers have a positive attitude towards the restructured curriculum at under graduate level. The study further noted that while comparing different sub-samples, it shows that the male teachers have a higher positive attitude than the female teachers. Again, teachers with average experience demonstrated a higher level of positive attitude towards the restructured curriculum than the more experienced.

In research conducted to find the attitude and confidence level of KG to B6 teachers in teaching the standards-based computing curriculum Ayebi-Arthur, Abdulai, and Korsah (2020) found that most KG – B6 teachers in Ghana were confident in handling the sub-strands of the standards-based computing curriculum. The researchers found out that the teachers exhibited high confidence level to teach the various sub-strands. They also found that basic school teachers have positive attitude towards the use of ICT and this was positively correlated with their confidence level. Jamieson-Proctor and Finger (2006) think that the quantity and quality of student use of ICT for learning is related to the teacher's gender, confidence, years of experience and school type. They further found that male teachers reported significantly higher levels of confidence in using ICT with students for teaching and learning and the students of male teachers or confident teachers use ICT more frequently to both enhance and transform the curriculum. They thus concluded that teacher confidence is a major factor in determining teachers' and students' engagement with ICT. Teaching is a profession which requires the impartation of knowledge and skills to students. The ability of the teacher to impart knowledge and skills determines the level of confidence of mastery of the subject matter and pedagogy possessed by the teacher.

Confidence is a crucial attribute that teachers need in the teaching profession for effective delivery of instruction (Nolan & Molla, 2017). McBer's model of teacher effectiveness defined confidence as "the belief in one's ability to be effective and to take on challenges" (McBer, 2001, p, 38). This implies that the teacher's

optimism in his or her ability in the teaching process can influence classroom practices. Again, the confidence level of teachers makes them embrace new teaching methods, strategies and challenge their creativity in the teaching profession. The confidence level of teachers in teaching content in any academic program cannot be underestimated. Lim-Teo, Low, Wong & Chong (2008) found a correlation between teacher preparation and quality teaching. Other researchers have found a correlation between school resources and confidence Lim-Teo, et al. (2008) content knowledge (CK) and confidence (Norton, 2017).

In integrating ICT into teaching, many studies have highlighted teachers' mixed feelings showing their low confidence levels (Hajara & Bukari, 2017; Mwila, 2018). However, a study done by Nikolopoulou and Gialamas, (2015) on teachers' beliefs and confidence established that teachers' have higher confidence in using ICT in the classroom which promotes positive engagement with learners. In another study on the influence of teachers' self-efficacy on perceptions, Miller, Ramirez, and Murdock (2017) suggested that teachers with strong confidence build good classroom interaction. It can be said that the confidence level of the teachers determines effective classroom management, which will influence learners' performance. Teacher confidence serves as an antidote for successful ICT usage in the classroom (Singhavi & Basargekar, 2019). Buabeng-Andoh and Yidana (2015) concluded that the availability of needed ICT resources with support can motivate teachers' ICT use in the classroom. This makes the teacher's role essential in teaching ICT-infused lessons.

ICT Policies in Ghana

The quest of the Government of Ghana to use ICT to develop the country's human resource led to the development of the Information Communication Technology for Accelerated Development (ICT4AD) framework (Ministry of Education, 2003). The Policy sought to empower the citizenry with ICT knowledge and skills needed to make the nation a knowledge and information-rich economy. In 2009, the policy was updated after considerable stakeholder engagement. In 2015, it was further reviewed to reflect the enormous changes that the ICT industry had experienced to reflect the state of the times (Ministry of Education, 2015). The ICT4AD policy sought to utilize ICT as a cross-cutting tool in the teaching and learning process. That is, the policy outlines how ICT should be used in transforming classroom

activities. It further proposed ICT as an elective and general course to be taught at pre-tertiary and tertiary institutions. The beliefs and attitudes of teachers towards change as well as the confidence level of teachers to teach new and emerging content in their subject areas are important especially, when implementing a new curriculum. In 2020, the National Council for Curriculum and Assessment (NaCCA) of the Ministry of Education, Ghana introduced the Common Core Programme (CCP). The CCP, which was originally intended to be a 4-year programme (JHS1-SHS1) comprised nine subjects including Mathematics, English, Career Technology, Computing, Creative Arts and Design, Social Studies, Physical and Health Education, Ghanaian language and RME (NaCCA, 2020). The CCP is now a 3-year programme beginning from B7 and ending B9.

This study investigates the critical factors that influence the successful implementation of the Common Core Programme (CCP) in Junior High Schools. Specifically, it examines the attitudes and confidence levels of B7-B9 teachers in teaching the CCP computing curriculum, as well as other key factors that shape teacher confidence and competence in utilizing ICT tools for instruction. The study holds significant importance for several reasons:

1. The CCP represents a crucial initiative to enhance students' computing and programming skills, essential for their future success in the digital age. Understanding teachers' attitudes and confidence levels is vital to ensuring the effective delivery of this curriculum.

2. Identifying the factors that influence teacher confidence, such as access to ICT resources and teacher skills, can inform targeted professional development programs. Empowering teachers with the necessary knowledge, skills, and resources can lead to more effective integration of technology in the classroom.

3. The CCP curriculum, when effectively delivered with the support of ICT tools, can foster the development of critical 21st-century skills, including computational thinking, problem-solving, and digital literacy. Understanding the factors that facilitate this process is crucial for preparing students for the demands of the modern workforce.

4. The findings of this study can inform policymakers and educational authorities in developing comprehensive strategies

and policies to support the successful implementation of technology-enhanced curriculum initiatives, such as the CCP, across the junior high school system.

The research was guided by the following research questions and hypotheses:

Research Questions

1. What is the confidence level of teachers in teaching the sub-strands in the Common Core Computing Curriculum?
2. What resources are available for teaching Computing at the JHS schools?
3. To what extent are teachers ready to use available facilities like Professional Learning Communities and top-up courses to prepare them to confidently teach the CCP Computing Curriculum?

Research Hypotheses

H_1: There is a relationship between the availability of ICT tools and teachers' confidence level in teaching the new common core computing curriculum.

H_2: There is a relationship between professional development avenue and teachers' confidence level in teaching the new common core computing curriculum.

Literature review
Theoretical framework

The study is underpinned by Rogers' Diffusion of Innovations Theory (Rogers, 2003). Diffusion of Innovations Theory explains, how, why and to what extent new ideas and technologies quickly spread in a given society. The theory remains relevant to evaluating technology adopters in the educational environment (Sutton & DeSantis, 2016). Rogers explained diffusion as the process by which innovation disseminates with time among people in a society. He proposed four key elements that affect how a new idea, concept or innovation is spread quickly. They are the "innovation, communication channels, time, and the social system" (Rogers, 2003). These four elements express the extent to which new ideas are adopted in society. He further explained the innovation-decision process as the stages an individual goes through in adopting new ideas or innovations. Five major stages were identified in the innovation-decision process. These five stages determine how an

individual adopts ideas or innovations. They are; Knowledge (the concept of understanding how an idea or innovation works), *Persuasion* (positive and negative attitude formation towards the idea or the innovation.) *Decision* (formation of choices leading to adoption or rejection of new ideas or innovations), *Implementation* (new ideas or innovation is put into practice) and *Confirmation* (confirmation of an already-made innovative decision).

In determining how quickly an individual adopts new ideas compared to other group members, Rogers (2003) classified the "degree" of people's adoption into adopter categories. He explained adopter categories as "the classifications of members of a social system based on innovativeness" (p. 22). As a result, he came out with five categories of adopters which are; innovators, early adopters, early majority, late adopters and laggards.
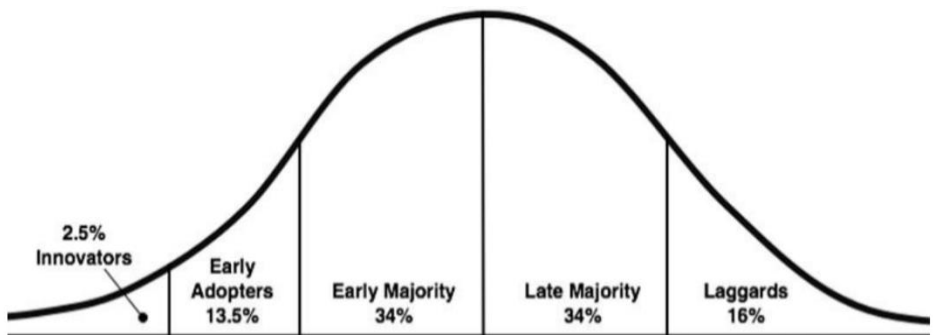
Figure 1*: Diffusion of Innovations Theory. Source: (*Rogers, 2003)

Rogers (2003) described the innovators as "active seekers" and eager for knowledge of novel concepts. They are internally motivated to drive change in society. Their willpower makes them adventurers, which makes them tolerate uncertainty. Even though innovators are not regarded in the social system, they are crucial in the diffusion process. Rogers added that innovators are people who are initiators of change in society. Early Adopters are most respected in the social system. They are the best source of advice and knowledge to others as they act like "role models" to other members of the social system. That is are influencers who convey a novel concept to others in society. They are also best described as the catalyst to speed up the diffusion process. The Early Adopters as described by Rogers as people who deliberately

adopt new inventions before the "average" members of the society. He further described them as not the first nor last to adopt innovation. They wait till innovation has been successfully implemented before they adopt it. Though they are not in a position in society but have good interaction with members. Their attitude helps to reach mass appeal which is important in the diffusion process. The Late Majority are people who adopt innovation when they see mass adoption. They adopt new ideas out of necessity not by choice. They are skeptical towards innovations. The Late Majority can be persuaded to embrace innovation when the "system norm" favors the innovation, as well as there, is a peer influence in the adoption process. Rogers (2003) described Laggards as the last group of people in the system to adopt an innovation after the Late Majority. They engage mostly with people who have conventional views like them and often feel resistant to change. Their resistance to change may be a result of their limited resources, they need to be certain of the success of innovation before they adopt. They wait till they are forced to adopt innovation as this slows their innovation-decision process.

From Rogers' theory of Diffusion of Innovation, one can conclude that teachers in the classroom can also be classified into the five groups of adopters with affordance to ICT tools for teaching. They can be Innovators, Early Adaptors, Early Majority, Late Majority or Laggards depending on how they have embraced ICT in the classroom instruction. Teachers' adaptability to the new computing curriculum will determine their self-efficacy in implementing the curriculum in the classroom.

Research Methods

The descriptive survey design was used for the study. Creswell (2012) noted that a descriptive research design helps to determine and report things naturally and attempts to present issues as feasible behavior, attitudes, ideals and characteristics. This study sought to describe the current situation on teachers' confidence and attitude teaching computing in B7-B9. This design was suitable for this study because it elucidates facts regarding teachers' opinions on teaching the common core curriculum as it occurs at the present time. The target population for the study comprises B7- B9 public school teachers in all 16 regions in Ghana, numbering 94,027 (Danso & Gadugah, 2022). The choice of B7-B9 teachers stems from the Computing Common Core

Programme Curriculum focusing on B7-B9. Besides, B7-B9 teachers may have pedagogical content knowledge in Computing necessary for this study.

The target sample size is 287 teachers, which was determined by an online sample size calculator. To ensure each region is proportionally represented, the sample size for each region was determined based on the total number of basic school teachers in that region. This proportional allocation ensured that larger regions with more teachers are adequately represented. Within each selected region, individual teachers were randomly selected to participate in the study. This was achieved using systematic sampling techniques to ensure unbiased selection. Below is the regional distribution of the respondents for the study: Greater Accra (51), Ashanti (51), Eastern (27), Central (27), Northern (22), Western (19), Volta (15), Upper East (12), Bono (11), Bono East (11), Upper West (8), Western North (8), Oti (7), North East (6), Savanah (6), Ahafo (5). In all, 287 teachers comprising 224 males and 63 females participated in the study. Basic school (B7-B9) teachers in Ghana exhibit diverse educational backgrounds, teaching experiences, and technological proficiencies, with significant variations influenced by geographic, gender, and resource availability factors. Understanding these characteristics is essential for addressing their attitudes and confidence levels in teaching the Computing Common-Core Programme Curriculum, highlighting the need for tailored professional development and resource support.

A self-developed structured questionnaire used for data collection was made up of five sections: Section A consisted of seven items and it focused on demographic information of the teachers. Section B focused on the confidence level of teachers to teach the various indicators in the Computing Curriculum. The section contained 39 items which was sub-divided into indicators in B7, B8 and B9 each having 13 items respectively. The questionnaire items were on a five-point Likert scale. Section C contained 7 items and was designed to enquire about the availability of ICT resources and Section D (seven items) enquired about the professional development avenue of teachers. The researchers followed a comprehensive process to develop and validate the research instrument for the study on "Basic School Teachers' Attitude and Confidence Level in teaching the Computing Common-Core Programme Curriculum in Ghana." This process involved a literature review, instrument development, content validity

assessment, pilot testing, reliability evaluation, and adherence to ethical considerations to ensure the instrument's credibility, reliability, and validity. The data collected was analyzed using means, standard deviation and correlation.

Results and Discussions

This section presents the findings as derived from the data analysis and discussions thereof. The researchers essentially presented the findings in line with the study objectives. The study sought to find out the confidence level of teachers to teach the indicators in B7-B9 computing curriculum. The analysis delved into the confidence of teachers, the availability of ICT tools for teaching and learning, and professional development avenues available to teachers. Again, the relationship between availability of ICT tools and teachers' confidence level as well as teachers' professional development avenues were analyzed.

The data collected to answer research questions 1 to 3 is presented below:

B7-B9 teachers' confidence in teaching the indicators of the common core computing curriculum

The research question sought to find out the confidence level of the teachers in relation to the new common core curriculum and. towards the various indicators under the study. Their level of agreement or disagreement was assessed through a Likert scale of 1 to 5 ranging from Strongly Disagree to Strongly Agree. The responses were analyzed using means and standard deviations. The result of this research question is displayed in Table 1 to 4.

Table 1: Teachers' confidence in teaching the B7 indicators (N = 287)

S/N	I can confidently teach the following Indicators in the CCP Computing Curriculum	Mean	Std. Deviation
1	B7.1.1.1.1 Discuss the second and third generation of computers	4.26	1.005
2	B7.1.1.1.2 Demonstrate understanding of the use of input devices (wireless keyboard, wireless mouse, light pen, touchscreen).	4.26	1.072

3	B7.1.1.2.1 Describe storage devices: full-sized external hard drives, hard drive speed, disk caching	4.34	1.055
4	B7.1.1.2.2 Discover the latest Windows Operating System (Start screen, Use of tiles, Taskbar buttons, Preview thumbnails)	3.84	1.255
5	B7.1.1.2.3 Practise file management techniques (file and folder management)	4.30	1.014
6	B7.2.1.1.1. Explain the importance of word-processing software	4.17	1.127
7	B7.2.2.1.1. Explain the importance of presentation software Exemplar(s):	4.38	1.048
8	B7.2.3.1.1. Explain the importance of electronic spreadsheet	4.30	1.018
9	B7.3.1.1.1 Draw diagrams to illustrate features of the network topologies (Bus, Star, Ring, Mesh)	4.36	1.017
10	B7.3.1.1.2 Describe types of networks [Personal Area Network (PAN), Local Area Network (LAN), Metropolitan Area Network (MAN), Wide Area Network (WAN)]	4.34	1.025
11	B7.3.2.1.1 Identify the various types and uses of Social Media sites such as those for Social Networking (Facebook, LinkedIn, WhatsApp) and Microblogging (Twitter, Tumblr)	4.18	1.083
12	B7.4.1.1.1 Demonstrate the correct use of programming terminologies	4.28	1.073
13	B7.4.1.1.2 Demonstrate understanding in the use of data types (e.g. float, integer, string, char, etc.)	4.41	1.017
Mean of Means		**4.2627**	**.94369**

From Table 1, the indicator with the highest mean (4.41) is indicator (B7.4.1.1.2 Demonstrate understanding in the use of data types (e.g. float, integer, string, char, etc.) followed by (B7.2.2.1.1. Explain the importance of presentation software.) and (B7.3.1.1.1 Draw diagrams to illustrate features of the network topologies (Bus, Star, Ring, Mesh) with a mean of 4.38 and 4.36 respectively. The mid value means is 3.84 for indicator B7.1.1.2.2 Discover the latest Windows Operating System (Start screen, Use of tiles, Taskbar buttons, Preview thumbnails.

Table 2: Teachers' confidence in teaching the B8 indicators (N = 287)

S/N	I can confidently teach the following Indicators in the CCP Computing Curriculum	Mean	Std. Deviation
14	B8.1.1.1.1. Discuss the fourth-generation computers	4.43	1.024
15	B8.1.1.1.2. Demonstrate understanding in the use of input devices (barcode, scanner, etc.)	4.35	1.023
16	B8.1.1.1.4 Examine Storage portable hard drives, Optical Discs and Drives.	4.41	.988
17	B8.1.2.1.3. Create a component from disposed computer parts.	4.16	1.039
18	B8.2.2.1.1. Demonstrate how to change text case, text size, text colour and decorate text	4.37	1.040
19	B8.2.2.1.3. Demonstrate the use of the Slide Master, design template, and be able to give a 5-slide presentation in MS-PowerPoint using the tools of the ribbons studied	4.05	1.149
20	B8.2.3.1.3. Demonstrate the use of the Autofill function in MS-Excel worksheet	4.38	1.010
21	B8.3.2.1. Demonstrate how to create formulas	4.32	1.041

22	B8.3.1.1.1 Describe the data communication models for networks.	4.39	1.004
23	B8.3.1.1.2 Describe the Internet, World Wide Web (www) and Internet Protocol (IP) addresses	4.02	1.209
24	B8.4.2.1.1 Apply variables, expressions, assignment statements and operator precedence order (BODMAS rule) to process and store numbers and text in a programme	4.05	1.127
25	B8.4.3.1.1 Describe the principles underlying the operation of the components of a robot (Controller Mechanical, Sensors)	3.83	1.231
26	B8.4.4.1.1 Discuss Artificial Neural Networks (ANN) and compare intelligence in humans, animals and machines	4.05	1.132
	Mean of Means	**4.2147**	**.94978**

From Table 2, the indicator with the highest mean (4.43) is indicator (B8.1.1.1.1. Discuss the fourth-generation computers) followed by (B8.1.1.1.4 Examine Storage portable hard drives, Optical Discs and Drives.) and (B8.3.1.1.1 Describe the data communication models for networks.) with a mean of 4.41 and 4.39 respectively. The mid value means is 3.83 for indicator B8.4.3.1.1 Describe the principles underlying the operation of the components of a robot (Controller Mechanical, Sensors).

Table 3: Teachers' confidence in teaching the B9 indicators (N = 287)

S/N	I can confidently teach the following Indicators in the Computing CCP Curriculum	Mean	Std. Deviation
27	B9.1.1.1.1. Discuss the fifth generation of computers with emphasis on quantum computing	3.85	1.225

28	B9.1.1.2.1 Explore the use of the Charms bar	4.13	1.056
29	B9.1.1.2.2. Practise file management techniques (Drive Management)	4.31	1.023
30	B9.2.1.1.1. Demonstrate how to create a table and hyperlinks	3.91	1.230
31	B9.2.3.1.1. Explain the importance of desktop publishing software (DTP)	3.80	1.190
32	B9.3.1.1.1 Discuss types of e-commerce and the cashless society (Bitcoin, Transaction cards, Quick Response code (QR) payment system)	3.94	1.160
33	B9.3.1.1.2 Justify eLearning potentials	3.67	1.268
34	B9.3.3.1.1 Discuss cyberbullying, cyberstalking, digital footprint and digital shadow on the Internet	3.65	1.278
35	B9.3.3.1.2 Explain ten (10) information hacking techniques on the Internet environment.	3.67	1.311
36	B9.4.1.1.1 Describe the conversion of decimal into binary data type for a computer to recognize the meaning, process and store	3.57	1.271
37	B9.4.2.1.1 Write a programme using a flowchart and Pseudocode algorithm that includes sequence, selection and iteration choices in problem-solving	3.37	1.365
38	B9.4.3.1.1 Construct a robot artefact using available lab components and tools or emulator/simulator software pack.	3.30	1.385
39	[B9.4.4.1.1. Describe the knowledge-based systems (Expert	3.14	1.346

systems) as the classical Artificial intelligence]		
Means	3.7156	1.04283
Mean of means	**4.05**	**0.926**

From Table 3, the indicator with the highest mean (4.31) is indicator (B9.1.1.2.1 Explore the use of the Charms Bar) with a mean of 4.13. The mid value means are 3.67 for indicator B9.3.1.1.2 Justify eLearning potentials and indicator [B9.3.3.1.2 Explain 10 information hacking techniques on the Internet environment]. Another mid-value mean, 3.65 was for indicator B9.3.3.1.1 Discuss cyberbullying, cyberstalking, digital footprint and digital shadow on the Internet. The indicators with low mean values (B9.4.4.1.1. Describe the knowledge-based systems (Expert systems) as the classical Artificial intelligence), (B9.4.3.1.1 Construct a robot artefact using available lab components and tools or emulator/simulator software pack.] and [B9.4.2.1.1 Write a programme using flowchart and Pseudocode algorithm that includes sequence, selection and iteration choices in problem-solving.] with a mean of 3.14, 3.30 and 3.37 respectively.

Table 4: Summary of Teachers' confidence in teaching the B7-B9

Level	Mean	Std
BS7	4.2627	.94369
BS8	4.2147	.94978
BS9	3.7156	1.04283
Overall Means	**4.05**	**0.926**

The overall mean score for teachers' confidence level in teaching the indicators of the CCP curriculum is 4.05 which is high. This result is in line with an earlier study by Ayebi-Arthur, Abdulai and Korsah (2020) which shows that teachers in the basic schools have high confident level in teaching the new standard-based curriculum. This is very good for the implementation of the CCP curriculum since it is the continuation of the standard-based curriculum in the country. The high

confidence level indicates most basic school teachers fit into the description of early adopters of the innovation diffusion theory.

ICT tools available for teaching and learning the Computing Curriculum

The research question sought to ascertain teachers' responses on the availability of ICT resources for teaching and learning computing in B7-B9. Their level of agreement or disagreement was assessed through a Likert scale of 1 to 5 ranging from Strongly Disagree to Strongly Agree. The responses were analyzed using frequencies and standard percentages. The result of this research question is displayed in Table 5.

Table 5: Availability of ICT tools (N = 287)

S/N	ICT tools available in my school	SD	D	U	A	SA
1	Desktop Computers	88 (30.7%)	32 (11.1%)	18 (6.3%)	93 (32.4%)	56 (19.5%)
2	Laptops	108 (37.6%)	54 (18.8%)	12 (4.2%)	76 (26.5%)	37 (12.9%)
3	Tablets	156 (54.4%)	67 (23.3%)	17 (5.9%)	29 (10.1%)	18 (6.3%)
4	Programming Textbooks	170 (55.7%)	66 (23%)	22 (7.7%)	25 (8.7%)	14 (4.9%)
5	English Dictionary Software	26 (9.1%)	23 (8%)	19 (6.6%)	110 (38.3%)	109 (38%)
6	Internet Source	98 (34.1%)	55 (19.2%)	25 (8.7%)	59 (20.6%)	50 (17.4%)
7	Algorithm Worksheets and Posters	152 (53%)	70 (24.4%)	27 (9.4%)	23 (8%)	15 (5.2%)

The data in Table 5 indicates that most of the resources listed are not available in the schools. Out of the seven ICT tools and resources listed, dictionary software and desktop computers had a high availability rate of 68.3% and 51.9% respectively. The rest of the tools listed had low ICT tools and resource availability rate. This suggests that most of the ICT tools and resources are not available for use by

basic school teachers to teach the common core computing curriculum. This result confirms earlier research by Ayebi-Arthur, Abdulai and Korsah (2020) which produced a similar outcome of unavailability of ICT resources for teaching and learning. This should be a source of worry for stakeholders since this tends to affect the implementation of the new CCP Computing curriculum. This result also resonates with research by Opoku (2016) which suggests that the majority of basic schools in the northern part of Ghana lack ICT tools. Again, Ampofo and Abrefi (2020) also give credence to the results by indicating that only a small number of basic schools have ICT facilities which affect its availability to teachers. Even though the confidence level and attitude of teachers are high, the unavailability of ICT tools may affect the teaching and learning of the Computing curriculum negatively. NGOs and other stakeholders who support education in basic schools are encouraged to increase their support in providing ICT tools to improve teaching and learning.

Professional Development Avenues

Research question 3 sought to find out the readiness of basic school teachers to use professional development avenues to prepare them to confidently teach the Computing Curriculum in B7-B9. Their level of agreement or disagreement was assessed through a Likert scale of 1 to 5 ranging from Strongly Disagree to Strongly Agree. The responses were analyzed using frequencies and standard percentages. The result of this research question is displayed in Table 6.

Research question 3 sought to find out the readiness of basic school teachers to use professional development avenues including Professional Learning Communities (PLCs) to prepare them to confidently teach the CCP Computing Curriculum. The result is displayed in Table 6.

Table 6: Professional Development Avenue

	Professional development avenues	SD	D	U	A	SA
1	PLCs and workshops will help to increase my knowledge	4(1.4%)	5(1.7%)	6(2.1%)	97(33.8%)	175(61%)

	teaching methods for Computing					
2	I believe my teaching approaches for teaching the CCP computing curriculum will improve with a few seminars	5(1.7%)	7(2.4%)	3(1%)	111(38.7%)	161(56.1%)
3	I am prepared to take advantage of school-based and cluster-based PLC sections to prepare me to teach the content of the CCP Computing Curriculum	5(1.7%)	3(1%)	2(0.7%)	101(35.2%)	176(61.3%)
4	I think a special Certificate Course should be organized for computing teachers to address their gaps in knowledge of the CCP Computing Curriculum	3(1%)	6(2.1%)	3(1%)	77(26.8%)	198(69%)
5	I believe PLCs can help teachers to reflect critically on their teaching practice	3(1%)	7(2.4%)	4(1.4%)	90(31.4%)	183(63.8%)
6	I think teachers can learn best practices in assessing and monitoring students' performance through PLCs	3(1%)	9(3.1%)	4(1.4%)	116(40.4%)	155(54%)
7	I think teachers can learn best practices in	3(1%)	10(3.5%)	6(2.1%)	116(40.4%)	152(53%)

assessing and
monitoring students'
performance through
Workshops

Table 6 shows that almost 95% of the respondents indicated that PLCs and workshops will help to increase their knowledge of teaching methods for Computing. Also, another 95% of the teachers agreed or strongly believed that their teaching approaches for teaching the CCP Computing curriculum would improve with a few seminars. The data in Table 6 also indicate that 96.5% of teachers are prepared to take advantage of school-based and cluster-based PLC sections to prepare to teach the content of the CCP Computing curriculum. Again, 95.8% of the teachers think that a special Certificate course should be organized for Computing teachers to address their gaps in knowledge of the Computing CCP curriculum.

In addition, 95.2% of the respondents believed that PLCs can help teachers reflect critically on their teaching practice. Further analysis of the result shows that 94.4% of the teachers think that teachers can learn best practices in assessing and monitoring students' performance through PLCs. Table 6 also shows that 93.4% of the teachers think they can learn best practices in assessing and monitoring students' performance through workshops. All the results show that most of the teachers are prepared to use PLC and other top-up courses to boost their confidence in teaching the CCP Computing curriculum which is a good sign for the curriculum implementation.

Relationship between the availability of ICT tools and teachers' confidence level in teaching the new common core computing curriculum
This hypothesis sought to find out the relation between the availability of ICT tools and teachers' confidence level in teaching the new common core computing curriculum. Pearson correlation was used to analyze the data and displayed in Table 7.

Table 7: Correlation between Availability of ICT tool and confidence level

		Availability of ICT Tools	Confidence level
Availability of ICT Tools	Pearson Correlation	1	.101
	Sig. (2-tailed)		.088
	N	287	287
Confidence level	Pearson Correlation	.101	1
	Sig. (2-tailed)	.088	
	N	287	287

The results in Table 7 indicate a positive correlation between the availability of ICT tools and the confidence of teachers to teach the new common core computing curriculum with a correlation value r = 0.101. Using the general guidelines provided by Cohen (1988), the value of 0.101 suggests a low positive correlation. With the p-value of 0.088 which is more than 0.05 shows that the relationship is not statistically significant. Nevertheless, this result corroborates several research findings which suggest a positive correlation between access to ICT tools and confidence level of teachers (Tasir, Mohammed, Halim, & Harun, 2012; Bingimlas, 2009; Fidelis & Daniel Oduor Onyango, 2021) Again the results match a similar study by Ayebi-Arthur, Abdulai and Korsah (2020) which shows that there is positive insignificant relationship between availability of ICT and the confidence of teachers. However, whereas that study produces a moderate relationship this one shows a low relationship between availability of ICT and the confidence of teachers. Even though teachers reported low availability of ICT resources, it seems they still have a high confidence level in teaching the indicators without the tools. This may be because the teachers are used to teaching without these ICT tools for a very long time and with time they have grown confidence in teaching without these tools. This situation is worrying because it may cause teachers not to use the ICT tools when available since they have grown confident without them. This tends to affect the students negatively.

Relationship between Professional Development Avenue and teachers' confidence level in teaching the new Common Core computing curriculum

This hypothesis sought to find out the relationship between professional development avenue and the confidence level of teachers in teaching the new computing curriculum. Pearson correlation was use to analyze the data and displayed in Table 8.

Table 8: Correlation between professional development avenue and teachers' confidence

Correlation		Professional Development Avenue	Confidence Level
Professional Development Avenue	Pearson Correlation	1	.414[**]
	Sig. (2-tailed)		.000
	N	287	287
Confidence Level	Pearson Correlation	.414[**]	1
	Sig. (2-tailed)	.000	
	N	287	287

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

The result in Table 8 shows that there is a positive correlation between professional development avenue and confidence level of teachers in teaching the new common core computing curriculum. According to a general guideline provided by Cohen (1992) the correlation value r = 0.414 indicates a moderate positive correlation but the p-value of 0.000 is greater than 0.05. This suggests that the relationship is statistically significant. The result shows that there is a statistically significant relationship between professional development avenue and teachers' confidence level in teaching the new common core computing curriculum effectively. This result contradicts Rokhyati (2015) who found no relationship between the two variables in English teachers in Indonesia.

Conclusion and Recommendations

The findings of this study have important practical implications for improving the implementation of the Computing Common-Core Programme curriculum in Ghana's basic schools. The key insights revealed by the study are:

Teachers' Confidence Level: The study found that teachers have a high level of confidence in teaching the indicators of the CCP Computing curriculum. This suggests that teachers are generally receptive and well-equipped to deliver the new curriculum, which aligns with the early adopter and early majority stages of the Diffusion of Innovation theory. This high confidence level is a positive foundation that can be leveraged to further enhance the successful implementation of the CCP.

Availability of ICT Tools: However, the study also revealed a major challenge - the lack of availability of ICT tools and resources for teachers to effectively teach the CCP Computing curriculum. Despite their high confidence levels, teachers are hindered by the lack of necessary technological resources in the classroom.

These findings point to critical areas that policymakers, teacher educators, and school administrators should address to support the successful implementation of the CCP curriculum.

Recommendations for Policymakers:

Increase Funding and Prioritize ICT Infrastructure: The government should significantly increase investment in providing ICT tools, equipment, and digital resources for basic schools. This should be a top priority to ensure teachers have the necessary technological infrastructure to effectively deliver the CCP curriculum.

Establish ICT Resource Centers: Considering the cost barriers, the government should establish centralized ICT resource centers that can serve clusters of nearby schools. This shared access to ICT resources can help overcome the challenges of individual schools acquiring these tools.

Recommendation for Teacher Educators:

Enhance Pre-Service and In-Service Training: Teacher education programs and professional development initiatives should place a stronger emphasis on preparing teachers to integrate technology and digital resources into their teaching practices. This will help build

teachers' pedagogical skills and confidence in utilizing ICT tools to teach the CCP curriculum.

Recommendations for School Administrators:

Facilitate Access to ICT Resources: School leaders should work closely with the government and other stakeholders to ensure their schools have reliable access to the necessary ICT tools and resources. This may involve exploring innovative partnerships or community-based initiatives to supplement any gaps in government provision.

Promote Collaborative Learning: Administrators should encourage and facilitate collaborative learning opportunities among teachers to share best practices, troubleshoot challenges, and collectively find solutions for effectively incorporating technology into CCP curriculum delivery.

By addressing these key areas through coordinated efforts, policymakers, teacher educators, and school administrators can create an enabling environment that supports teachers' confidence and equips them with the necessary resources to successfully implement the Computing Common-Core Programme curriculum in Ghana's basic schools.

Limitations of the Study

This study is limited to basic schools (Junior High Schools) within Ghana. The findings may not be fully generalizable to other educational contexts or countries, as the sociocultural, economic, and policy environments can vary significantly. Also, the study may be limited by the sample size of participating teachers and the extent to which the sample is representative of the overall population of basic school teachers in Ghana. Factors such as teacher demographics, school locations, and resource availability may not be fully captured. Finally, the study relied on self-reported data from teachers regarding their attitudes, confidence levels, and perceptions. Self-reported data can be subject to bias, including social desirability bias or inaccurate self-assessment. Despite these limitations, the study provides valuable insights into the attitudes and confidence levels of basic school teachers in Ghana towards teaching the Computing Common-Core Programme Curriculum. Future research could address these limitations by expanding the sample size, including a more diverse range of schools and teachers, and incorporating objective measures of teacher attitudes

and confidence levels, such as classroom observations and performance assessments. By doing so, a more comprehensive understanding of the factors influencing teachers' effectiveness in teaching computing education in Ghana can be achieved.

Ethical Standards and Guidelines

The research on basic school teachers' attitudes and confidence levels in teaching the Computing Common-Core Programme curriculum in Ghana adhered to ethical standards that prioritized informed consent, confidentiality, respect for autonomy, promotion of beneficence and social value, researcher integrity and accountability, and responsible dissemination of findings to ensure the study's ethical conduct and positive impact on educational practices and policies.

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School-Based In-Service Training Programmes: Perceptions of Basic School Teachers and Administrators of East Mamprusi Municipality, North East Region of Ghana

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Abstract

Effective teaching and learning at the basic school have often been linked to good teacher professional knowledge and skills, acquired not only through pre-service teacher education but also participation in in-service training programmes. This paper reports on a study which explored the perceptions of basic school teachers in the East Mamprusi Municipality about in-service training programmes. The concurrent triangulation research design was employed in the study, which included 17 public junior high schools in the study area. A sample size of 72 teachers was obtained using the simple random sampling method, while 17 head teachers were purposively sampled. Questionnaire and interview were used to collect data. Frequency counts and percentages were the descriptive statistical tools used for the data analysis. The study established that in-service training programmes are more effective if schools are empowered to organise such programmes for teachers. Also, the study found that participation in-service training programmes enhanced teachers' knowledge of content in their respective subject areas. The findings further revealed that in-service training programmes enhanced teachers' knowledge on pedagogy and increased their motivation at work. It was recommended that basic schools be empowered to organise in-srvice education and training (INSET) and take steps to institutionalise its implementation for the continuous professional development of teachers.

Keywords: In-service training; education; teacher; perception; life-long learning; Ghana

Introduction

Teachers are a critical resource for the education provision function because their level of professional knowledge and skills has a bearing on student achievement (Roberts & Sampson, 2011). Teachers are required to facilitate learning processes within the school setting and also serve as agents for creating desired change in the attitudes of learners. This calls for the need to equip teachers with the requisite knowledge and skills to enable them perform these roles as expected (Roberts & Sampson, 2011). The need for educators to continuously upgrade their professional knowledge and skills by engaging in lifelong learning has been emphasised. Fischer (2000) observes that lifelong learning promotes effective educational opportunities in the many learning settings through which people pass, including the home, school, work place and the larger political community.

Pre-service training of teachers provides participants with skills and knowledge to enable them carry on as facilitators and agents of change (Mankoe, 2002). This initial training, however, cannot fully equip the teacher with the skills, knowledge and competencies to teach for life. There is the need, therefore to update the teachers' knowledge periodically, especially in the face of knowledge explosion and curricula changes which have affected content and pedagogy (Mankoe, 2002). This call has been corroborated by the United States Agency for International Development, USAID (2009) which states that all teachers should be included in the learning opportunities through effective in-service professional development programmes, and that most of the in-service training programmes must be based at the school and cluster levels.

Statement of the Problem

In-service Education and Training has been widely recognised as one of the most effective measures for enhancing teacher quality and performance (Mankoe, 2002). As a step towards improving the performance of basic school pupils, the Ghana Education Service, GES (2007) developed a framework for the implementation of In-service Education and Training (INSET) programme at the basic education level, aimed at establishing an institutionalised structure for the continuous professional development of basic school teachers and to address the challenges teachers face with respect to pedagogy and content. Abu (2011) carried out a qualitative study to determine the

perceptions of primary school teachers in the East Mamprusi District about in-service training programmes and reported that teachers recognised the programmes as vital tools for their professional growth but expressed reservations regarding the quality of such programmes and the effective utilisation of the outcomes. The current study however employed the integrative mixed methods approach to find out the perceptions of Junior High school teachers and administrators in the East Mamprusi Municipality about in-service training programmes in terms of school-based organisation, challenges and impact on teacher quality.

Research Questions
1. What are the perceptions of basic school teachers and administrators in the East Mamprusi Municipality about in –service training?
2. To what extent has participation in in–service education and training equipped basic school teachers in the East Mamprusi Municipality to improve teaching and learning?

Literature Review

Theoretical Framework
The study was based on the human capital theory, proposed by Schultz (1961). Using the theory, Schultz introduced returns on investment which highlights the cost benefit analysis of training and education. According to the human capital theory, education or training raises the productivity of workers by imparting useful knowledge and skills. It postulates that expenditure on training and education is costly and should be considered an investment. The human capital theory is applicable to this study because it helps to highlight the sort of benefits that the human resources responsible for teaching within a school setting could derive from participation in in-service training. By encouraging teachers to attend in-service training, their professional skills and conduct are enhanced and they grow to eventually recognise the feasibility of high level of performance. The researchers, therefore, found the applicability of the human capital theory to the study appropriate to find out the perceptions of teachers about in-service training programmes; and whether such programmes have any influence on teacher quality in the East Mamprusi study area.

The Concept of In-Service Training

In-service training is believed to be one of the ways for teachers to gain knowledge and skills through direct experiences and informal interactions with colleagues (Canman, 2000; Tortop, 2005). Various organizations the world over, have adopted and embraced the concept of in-service training as a strategy for attaining organisational goals (Kennedy, 2005).

Some scholars have, however conceptualised in-service training as being synonymous with professional development and argue that the two terms could be used interchangeably. Whereas Burk (2000) describes professional development in the context of a school system, as a planned, comprehensive and systematic programme to improve the ability of personnel in the design, implementation and assessment of productive change, Saiti and Saitis (2006) maintain that professional development focuses on activities that develop an individual's knowledge and skills to enable him/her contribute to the improvement of practice through active roles. For professional development programmes to be relevant and greatly contribute to classroom practice however, such programmes must be collaborative, extended over time and connected to several elements of instruction, such as the curriculum, use of appropriate methodology and assessment procedures (Cohen & Hill, 2000). Arguing differently, Stella (2014) expresses the view that in-service training implies staff development because it is a process that is designed to positively affect knowledge, skills and attitudes of teachers in an attempt to help them improve the learning of students. Stella's (2014) view has been found to corroborate that of Mankoe (2007) as he describes in-service training as being synonymous with staff development, which educational institutions take to provide their staff a kind of preparation that enables the staff to updrage themselves and remain competent on the job. Mankoe further identifies two approaches to adopt in mounting staff development or in-service training programs in educational institutions, namely: coaching and mentoring. Coaching, according to Mankoe deals with assisting teachers to acquire skills relevant for classroom practice and focuses on the transfer of knowledge and skills gained from staff development programmes to the classroom situation while mentoring involves an experienced teacher providing assistance to a new professional for the purpose of professional growth and opening a pathway for the young professional to become established.

Teachers and Head Teachers' perceptions of INSET

In a descriptive survey of 100 rural primary schools in Kenya to find out the perceptions of teachers and head teachers regarding in-service training or staff development programmes, Frederick and Stephen (2009) report that various types of staff development programmes were engaged in by teachers and head teachers. Such programmes, according to Frederick and Stephen, include pursuing courses in higher education, participating in seminars and workshops, consulting teacher advisory centers, school based in-service facilitated by subject specialists, use of community resource persons, teacher-to-teacher assistance and head teacher-to-teacher assistance. Furthermore, Frederick and Stephen found that teachers expressed a stronger perception that getting involved in in-service training programmes will improve their teaching effectiveness as compared to their colleagues who do not participate in in-service training programmes. Again, Frederick and Stephen found that head teachers in high- performing schools had a good track record of participation in in-service training programmes and, hence, developed enhanced instructional and leadership skills as compared to their colleagues in low-performing schools in the Kenyan education system.

Bulut (2022) used the case study design and a semi-structured interview to determine the perceptions of teachers working at various levels of formal education in Turkey towards in-service training activities. The study found that, a significant percentage of the teachers did not find the in-service training activities they participate in sufficient, in terms of scope and content, and they preferred in-service training on subjects such as information technologies, special education, training coaching, developmental psychology, teaching methods and techniques, software and material preparation.

In the study conducted by Durmuş (2003) teachers' opinions about in-service training activities organized for classroom teachers were examined. In the study, teachers complained that in-service training activities were not held at appropriate times, their opinions were not taken, the scope of activities was insufficient, and the methods or techniques used were ineffective. In another study, most administrators and teachers expressed preference for INSET programmes that integrate not only ICT and other 21st century skills but also subject content knowledge, pedagogical knowledge and pedagogical content knowledge. The administrators further took the view that the facilitators

assigned in in-service training activities are not usually selected from among experts in their fields (Aslan, 2019; Karadağ, 2015).

In-Service Education and Training in Ghana

Ghana's Education Act of 2008 established the National Teaching Council (NTC) with the responsibility for setting standards and code of practice for professional development, registration and licensing of teachers. Specifically, section 10 of the 2008 Education Act stipulates that the NTC takes responsibility for periodic review of teachers' professional practice and ethical standards through in-service education and training. Consequently, the Pre-tertiary Teacher Professional Development and Management (PTPDM) policy states that teacher education and training shall comprise pre-service and a system of in-service training for all graduating teachers from accredited tertiary institutions in Ghana. Also, teacher professional development in Ghana, as the PTPDM policy states is expected to reflect the training needs of teachers and as well recognise and reward their professional growth and achievements, which comes in the form of enhanced remuneration for those who acquire higher certificates and degrees. The PTPDM policy (2012) spells out the structure of pre-tertiary teacher development in Ghana as having the following features: initial teacher training programmes (4 years); induction and initial INSET programmes (within one year after pre-service training); In-service education and training (INSET) which is continuous for updating professional knowledge and skills and upgrading programmes including open and distance learning and sandwich programmes.

In-service Training Programmes and the Roles of School Administrators

School administrators play a key role in the achievement of educational goals and objectives (Stella, 2014). In conformity with their fundamental roles, Bush and Oduro (2006) argue that administrators are basically trained to enable them play management functions. This implies that school administrators might not have had adequate exposure regarding instructional practices of classroom teachers. However, Barrow and Boyle (2007) posit that school administrators and supervisors should participate in continuous professional development programmes as this would give them exposure to the same knowledge, skills and commitments that teachers gain through in-service training programmes. This view agrees with the Pre-Tertiary

Teacher Professional Development and Management (PTPDM) policy framework (2012) developed by the Ghana Education Service. The policy mandates head teachers, circuit supervisors and representatives of the district education office to collaborate in the organization of school and cluster-based INSETs and to observe, monitor and report on programmes they attend. It has thus become clear that head teachers are not only responsible for the implementation of INSET programmes in their respective schools, but they are also expected to participate in such programmes in order to gain better insight on classroom practices of teachers.

The impact of INSET on Teaching and Learning

Research carried out by various scholars highlight the relevance of in-service training to the professional development of teachers which in turn impacts positively on learning outcomes. The fact that education is a life-long process accounts for the reason why the teacher should continue to learn throughout his/her life.

Frederick and Stephen (2009) in a study to determine the impact of in-service training programmes on teaching and learning in the Kenyan educational system report that teachers participate in such programmes to acquire more knowledge and skills in the following areas: school management and instructional leadership, teaching methods, use of teaching resources, evaluation techniques, understanding factors which affect learning, knowledge of subject matter/content area, general knowledge on teaching as a profession and guidance and counseling. Mastery of content matter of any subject enhances teachers' effectiveness on cognitive aspects of education and facilitates pupils' academic achievement (Frederick & Stephen, 2009). Additionally, Frederick and Stephen argue that seeking more knowledge on teaching as a profession motivates teachers to take their roles seriously. With specific reference to head teachers, Frederick and Stephen state that head teachers who participate in in-service training programmes are able to provide effective instructional leadership and more often register high academic achievement on the part of their students. In the Ghanaian context, the Pre-tertiary Teacher Professional Development and Management (PTPDM) policy framework (GES, 2012) supports the issues raised by Frederick and Stephen. The policy highlights the importance of INSET by stating that the programme is designed to ensure a systematic improvement of the quality of teachers

in terms of mastery of content and better understanding and use of teaching techniques for effective lesson delivery.

Literature review has revealed that In-service Education and Training (INSET) is relevant for teacher improvement, hence, school administrators are expected to be proactive in organising such programmes for the benefit of teachers who are implementers of the curriculum. It has also come to light from literature, that the INSET programme in the Ghanaian context has a legal backing: The Pre-tertiary Teacher Professional Development and Management (PTPDM) policy framework (GES, 2012) provides for the implementation of In-service Education and Training (INSET) programmes at the pre-tertiary education level.

Methodology

The concurrent triangulation research design was used in the study. This design involves the use of more than one method to confirm, cross-validate or corroborate findings within a study (Creswell, 2003). The integrative mixed methods approach enables the researcher to collect data by the concurrent triangulation strategy and generalize to a population in order to develop a detailed view of the meaning of a phenomenon or concept (Creswell, 2003). The choice of the concurrent triangulation strategy made it possible to collect both closed ended quantitative data and open-ended qualitative data which proved advantageous to best understand the research problem. The concurrent triangulation research design has been found to have a number of advantages. First, it allows for the use of words and narratives to add meaning to numbers and to answer a broader range of research questions because the researcher is not confined to a single method or approach. Again, the use of this research design in the conduct of the study could add insights and understanding that might be missed when only a single method is used.

The simple random sampling technique was employed to obtain a sample of 72 teachers out of an entire population of 134 Junior High school teachers whilst 17 head teachers were purposively selected from the 17 Junior High schools to participate in the study. The choice of the simple random sampling technique was informed by the desire to reduce the potential human bias in the selection of cases to be included in the sample; and to provide an equal chance of selecting each unit from the population being studied (Anthonio, 2011). The head teachers

were purposively selected because they were capable of providing the information relevant for answering specific research questions in the study.

Questionnaire and semi-structured interview were used for the collection of data. The questionnaire was made up of open-ended and close-ended questions. Most of the items were, however, of the close-ended type and respondents were required to tick the most acceptable responses among the options provided; and in some cases to rank the responses where the items are of such nature. The questionnaires were administered to 72 subject teachers and 17 head teachers serving at the JHS level of education in the East Mamprusi Municipality. Interview was conducted with a sample of 10 teachers (5 males and 5 females), randomly selected from the 72 teachers who participated in the study, and the 17 head teachers. The interview was administered to the two category of respondents on separate days.

The research instruments were subjected to both validity and reliability tests. Face validity was ensured through expert judgement. Content validity of the research instruments was also ensured through expert judgment. The reliability of the research instruments was estimated using Cronbach's alpha reliability test which yielded a reliability coefficient of 0.74. George and Mallery (2003) state that a Cronbach's alpha reliability coefficient greater than or equal to 0.7 is acceptable, hence the instruments were reliable

Quantitative data that was derived from the demographic section of the questionnaire and other close-ended questions were analyzed using descriptive statistics such as percentages and frequency counts. On the other hand, qualitative data generated from open-ended questions were organized into themes and discussed in line with the research questions.

For the qualitative data derived from focus group interviews, thematic content analysis was employed where the interview data was closely examined to identify common themes i.e. topics, ideas and patterns of meaning that come up repeatedly. The semantic approach, which involves analyzing the explicit content of interviewee's stated opinions was used to create a coherent narrative in respect of the opinions expressed by the respondents.

A total of 89 questionnaires were distributed to 17 head teachers and 72 teachers, all of which were responded to and returned.

Results and Discussion

Demographic information

In order to understand the population under study, demographic information was sought of the head teachers and teachers, in terms of their gender and educational qualification.

Table 1: Gender of Respondents

Variable	Respondents	Categories	Frequency	Percentage
Gender of respondents	Head teachers	Male	11	64.7
		Female	6	35.3
		Total	**17**	**100**
Gender of respondents	Teachers	Male	48	66.7
		Female	24	33.3
		Total	**72**	**100**

As shown in Table 1, 64.7% of the head teachers were males while 35.3 percent were females. This suggested that both males and females had opportunity to occupy headship positions in basic schools within the East Mamprusi municipality. The data further revealed that there were more male teachers in the JHS sector as compared to females (66.7 percent male as against a 33.3 percent female representation).

Table 2: Educational Qualification of Respondents

| Respondents' Academic Qualification	Head teacher		Teachers	
	Frequency	**Percent**	**Frequency**	**Percent**
Cert A.	0	0	3	4.2
Diploma	3	17.6	56	77.8
Bachelor's Degree	14	82.4	13	18
Total	17	100	72	100

Table 2 points to the fact that the respondents had received academic and professional training at various levels. This implied that they had met the minimum qualifications to serve as teachers in their respective schools, and hence constituted potential beneficiaries of In-service Education and Training.

Data analysis based on Research Questions

Research Question 1: What are the perceptions of basic school teachers and administrators in the East Mamprusi Municipality about in –service training?

To address this question, responses were elicited from respondents in two phases. First of all, the respondents were asked to indicate whether they had attended any in-service training programmes in the past, and the frequency of attendance. The responses were analyzed as shown in figure 1.

Figure 1: Respondent attendance to in-service training programmes
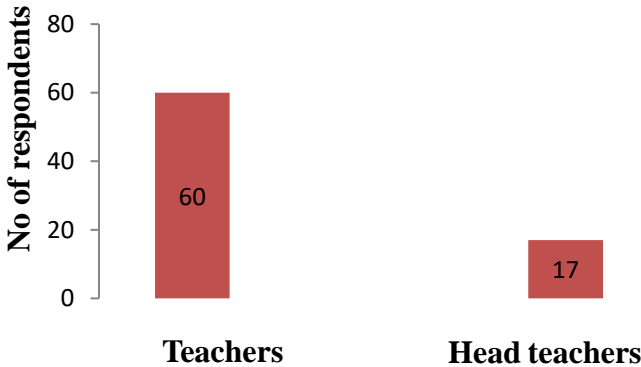
From Figure 1, all 17 head teachers (representing 100%) who responded to item 7 of the questionnaire had participated in one form of school-based in-service training or the other. Sixty (60) teachers (83. 3%) indicated their participation in school-based in-service training whilst the remaining eleven teachers (16.7%) said they were yet to have an opportunity to participate in INSET programmes at the school level. This confirms that INSET is not a familiar phenomenon to all teachers in the East Mamprusi Municipality. It further suggests that the In-service Training and Education (INSET) programme has a legal status in Ghana's education system as stated in the Pre-tertiary Teacher Professional Development and Management (PTPDM) policy (2012). The policy states that teacher education and training shall comprise pre-service and a system of in-service training, starting with an induction programme into teaching for all graduating teachers from the colleges

of education, the Universities and other accredited institutions in Ghana.

Furthermore, the respondents were asked to state their level of agreement with issues related to in-service training in the areas of participation, utilisation of knowledge/skills gained, motivation for attendance, course content and effectiveness of the programmes. They were to rank their responses to items in the questionnaire where Strongly Agree (SA) was coded as (4), Agree (A) was coded as (3) whiles Disagree (D) and Strongly Disagree (SD) were coded as 2 and 1 respectively. Shown in Table 4.3 were the teachers' responses to the issues as enquired by the data collection instrument.

Table 3: Teachers' Perceptions and Understanding of issues on In-service training

	SA		A		D		SD		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Voluntary participation in in-service training	52	72.2	15	20.8	4	5.6	1	1.4	72	100
Shorten duration of in-service training	40	55.6	17	23.6	5	6.9	10	13.9	72	100
Eager to apply knowledge gained from in-service	37	51.4	5	6.9	10	13.9	20	27.8	72	100
INSET forms part of Professional development for teachers	62	86	4	5.6	3	4.2	3	4.2	72	100
Incorporate instructional leadership in INSET programmes	32	44.5	25	34.7	8	11.1	7	9.7	72	100
Emphasize pedagogy & content knowledge in INSET programmes	45	62.5	20	27.8	6	8.3	1	1.4	72	100
Promote teachers based on INSET attendance	33	45.8	20	27.8	10	13.9	9	12.5	72	100

Table 3 above shows that a good number of the respondents (86%) recognised that in-service training forms part of the professional development programmes for teachers while 72.2% indicated their willingness to voluntarily participate in in-service training programmes

for teachers. Frederick and Stephen (2009) elaborate that teachers engage in various types of staff development programmes. Such programmes, according to Frederick and Stephen, include pursuing courses in higher education, participating in seminars and workshops, consulting teacher advisory centers and school based in-service facilitated by subject specialists. However, few of the participants (1.4%) stated that they would participate in in-service training only if such programmes are mandatory. Furthermore, 27.8% of the respondents indicated that they were not eager to apply the knowledge and skills they had gained from in-service training in their classroom practice. Contrary to these views, the Pre-Tertiary Teacher Professional Development and Management (PTPDM) policy (GES, 2012) stipulates that In-service Education and Training (INSET) has been institutionalised in all basic schools in Ghana, and has therefore become mandatory for teachers. The respondents also expressed stronger perception regarding the content of in-service training programmes. A reasonable number of the teachers (62.5%) stated that in-service training programmes should emphasise both pedagogical and subject content knowledge, 1.4% of them were however opposed to this view. Stella (2014) however emphasised that staff professional development should include those processes that improve job-related knowledge, skills and attitudes of teachers.

Research question 2: To what extent has participation in In–Service Education and Training equipped basic school teachers in the East Mamprusi Municipality to improve teaching and learning?

To address this, a number of questions were posed to the two categories of respondents who participated in the study (head teachers and teachers) to determine the various ways in which in-service training had impacted on them to improve teaching and learning. The responses were analysed as shown in Table 4 and Figure 2 respectively.

Table 4: Perceived effect of In-service training on Basic School Administrators (Head teachers)

Variable	Responses	Percent
Enhanced managerial skills	4	23.4
Increased subject content knowledge	2	11.8
Increased knowledge on pedagogy	3	17.6
Higher professional qualification	2	11.8
Increased motivation at work	2	11.8
Integration of ICT and other 21st century skills	2	11.8
Exposure to pedagogical content knowledge	2	11.8
Total	**17**	**100**

From Table 4, the administrators perceived enhanced managerial skills and increased knowledge on pedagogy as the greatest impacts in-service training had made on the professional performance of head teachers (23.4% and 17.6% respectively). This finding concurs with the view expressed by Barrow and Boyle (2007) who posit that school administrators and supervisors should necessarily participate in continuous professional development programmes as this would give them exposure to the same knowledge, skills and commitments that teachers gain through in-service training programmes. Barrow and Boyle add that, such participation in INSET consequently enables school administrators and supervisors to exercise instructional leadership by way of professional guidance and pedagogical support to improve practice in schools. It was also inquired from teachers the various ways in which in-service training had impacted on them to improve pupils' learning outcomes. Their responses were analyzed as shown Figure 2.

Figure 2: Ways in which in-service training programmes impact on teachers.
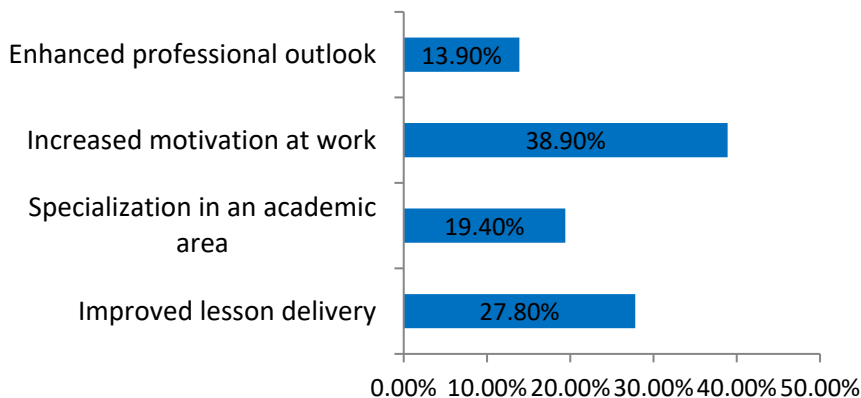
From Figure 2, it can be seen that improved lesson delivery (27.8%) and increased motivation at work (38.9%) stood out as the greatest impact in-service training programmes have had on teachers' professional performance. The implication of this finding is that participation in in-service training by teachers motivates them well enough at the work place as compared to other benefits of such programmes. This could arise from the fact that certain in-service training programmes, such as further studies usually result in the award of certificates to participants. It is also shown from Figure 2 that, 10 teachers (13.9%) stated that participation in in-service training programmes enhanced their professional outlook while 14 teachers (19.4%) indicated that participation in in-service training programmes created opportunity for them to specialize in an academic area in terms of content knowledge. This corroborates the findings of Douglas and Tim (2008) who state that content-focused teacher professional development is positively associated with teacher productivity and by extension, enhanced pupil performance.

Results of interview of respondents
In all, a sample of 10 out of 72 teachers, and 17 head teachers at the Junior High School level in the East Mamprusi Municipality were taken through a focus group interview using the same interview guide. Key themes generated from the interview data focused on Compulsory

participation in INSET, Impression on INSET Implementation at the JHS level and impact of INSET on teacher quality.

Qualitative Data Analysis:
Result of Interview of Head teachers
Interview with the 17 head teachers who participated in the study showed that they were in full support of compulsory attendance of INSET by JHS teachers
Theme 1: Compulsory attendance of INSET by JHS teachers in the East Mamprusi Municipal.
When the headteachers were asked about their views in respect of making INSET compulsory or voluntary for teachers, some of them remarked:
Headteacher: *"Look, teachers should not be given any option to choose whether to attend INSET or not. The fact is that, teachers can only be effective in their classroom activities if they update their professional knowledge through INSET. The programme (INSET) must be compulsory for teachers and headteachers alike, not optional for any reason"* (Interview data, 2022)
Theme 2: Impression on INSET Implementation at the JHS level
Interview questions under this theme sought to solicit the views of respondents as to whether the district education office should serve as the implementing body or the schools. The respondents' expressed varied views related to the implementation of INSET at the JHS. While 7 head teachers (41.2%) were of the view that the District Education Office should take up the responsibility of organising INSET in the schools, the remaining 10 head teachers (58.8%) took the view that the implementation of INSET at the JHS is vital and that the organisation of same should be left to the schools.

Result of Interview of Teachers
Theme 1: Compulsory attendance of INSET by JHS teachers in the East Mamprusi Municipal.
On the theme of compulsory attendance of INSET, the teachers who were interviewed   unanimously held a common view as remarked by one teacher *"...if attendance to in-service training is made compulsory, we may be present but not take anything serious"*.
Theme 2: Impression on INSET Implementation at the JHS level

When asked about their impression regarding the implementation of INSET at the JHS, all the 10 respondents expressed the view that it is a welcome idea, and that head teachers should be charged with the responsibility of organising the programmes at the school level. This position corroborates the views expressed by the majority of head teachers (58.8%) who responded to the same interview question, that organisation of INSET should be left in the hands of school management

Theme 2: Impact of INSET on teacher quality

When asked whether participation in INSET programmes has any benefits for teachers, all the 10 respondents held a unanimous view in respect of participation in INSET and teacher quality. They stated that participation in INSET has a potential to enhance teacher quality, in terms of knowledge of subject content and pedagogy.

Conclusion

Based on the findings of the study, it was concluded INSET is a well-known phenomenon among and school administrators. This came to light when all the headteachers who took part in the study indicated they had participated in some forms of INSET programmes. The findings of the study also show that in-service training forms part of the professional development programmes for teachers, and could take a variety of forms, such as engaging in further studies and participating in seminars and workshops

The findings of the study further show that attending in-service training programmes positively affect the quality of teachers and head teachers to improve teaching and learning at the basic school level. This came to the fore when participants of the study responded to the interview question that solicited their views on the impact of INSET on teacher quality. It also emerged from the study that organisation of INSET programmes at the school level, if left in the hands of head teachers, will be more effective.

Recommendations

Based on the results of this study, the following recommendations were made: The Ministry of Education (MOE) and Ghana Education Service (GES) should take steps to institutionalise INSET at the basic school level and put measures in place to ensure effective implementation of same. The researchers also recommend that

tertiary education curriculum developers take steps to include In-Service Education and Training (INSET) courses in the curricula of teacher training institutions to provide pre-service teachers an opportunity to study about INSET as part of the official curriculum. Further, it is recommended that outstanding participation of teachers in INSET is recognized by way of citations. This would serve as a motivational package and would eliminate the incidence of apathy on the part of teachers towards INSET.

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