

# Impact of Reflective Practice on Teachers' Professional Practices in Ghanaian High Schools

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**Abstract :** This study investigates the impact of reflective practice on the professional practices and reflective thinking levels of science teachers in Senior High Schools and Senior High Technical Schools in Ghana. The research aims to assess how reflective practice influences teachers' engagement with professional standards, such as planning and preparation, instruction, classroom environment, and professional responsibility. A mixed-methods approach was used, combining quantitative data from a structured questionnaire and qualitative analysis of teachers' written reflections. A total of 51 science teachers from three schools participated, representing urban, peri-urban, and rural settings. The results showed that reflective practice had an average impact on planning and preparation, instruction, and classroom environment, but a low impact on professional responsibility. Most teachers engaged in reflective practices at the "Habitual Action" and "Understanding Reflection" levels, with none reaching the "Critical Reflection" stage. The study highlights the need for further support in developing deeper reflective practices, particularly critical reflection, to improve teaching effectiveness and foster professional growth. The findings suggest that schools should integrate structured reflection opportunities into teacher evaluations and offer professional development focused on fostering transformative reflective practices for sustained improvement in teaching and learning outcomes.

**Keywords:** Levels, Professional Practice; Standards; Reflection; Science Teachers



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## Introduction

The foundation for effectively implementing quality curriculum in the classroom heavily depends on the application of appropriate professional practices by teachers. In Ghana, the traditional model of teacher preparation emphasized learning content knowledge and applying it during the pre-service teaching practicum. However, contemporary teacher education systems have shifted to incorporate reflective practice, an essential element for teacher development worldwide. Reflective

practice encourages both pre-service and in-service teachers to critically analyze their teaching methods, experiences, and outcomes to improve their future teaching practices and professional growth<sup>1</sup>. This shift aligns with global educational trends where reflection is seen as an essential tool for enhancing teaching practices and ensuring quality education<sup>2,3</sup>.

Reflective practice is defined as a process where teachers engage in systematic inquiry to assess and improve their instructional practices. It allows teachers to examine their teaching methods, analyze student responses, and modify their approaches for better future outcomes<sup>45</sup>. Teachers who actively engage in reflective practices are more likely to identify effective teaching strategies and address areas of improvement<sup>678</sup>. This process also helps teachers develop a stronger professional identity, which significantly impacts their teaching quality, particularly in science education<sup>9</sup>. In Ghana, the integration of reflective practice into teacher education is crucial for improving teaching quality and meeting the challenges of implementing a new curriculum, particularly in Senior High Schools (SHS).

In recent years, the Ministry of Education in Ghana has prioritized professional development for SHS teachers, focusing on reflective practices to prepare teachers for the new Standard-Based Curriculum. These professional development sessions emphasize various aspects of teaching, including lesson planning, classroom organization, assessment methods, and reflective practice. While these efforts aim to equip teachers with the necessary skills and knowledge, there remains a gap in understanding how reflective practices are influencing their professional teaching standards in the classroom. Therefore, it is crucial to assess the impact of reflective practice on teachers' professional practices, particularly within the context of science education in Ghanaian SHS.

The purpose of this study is to determine the impact of reflective practice on science teachers' professional practices in selected Senior High Schools and Senior High Technical Schools in Ghana. Specifically, this study seeks to explore the influence of reflective practice on science teachers'

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<sup>1</sup> Slade, M., Burnham, T., Catalana, S., & Waters, T. The impact of reflective practice on teacher candidates' learning. *International Journal for the Scholarship of Teaching and Learning*, (2019), 13(2), Article 15. DOI.org/10.20429/ijso.2019.130215

<sup>2</sup> Rodgers, C, Defining reflection: Another look at John Dewey and reflective teaching. *Teachers College Record*, 104 no 4 (2002)., 842-866.

<sup>3</sup> Farrell, T. TESOL, a profession that eats its young! The importance of reflective practice in language teacher education. *Iranian Journal of Language Teaching Research*, 4 no 3, (2016a). 97-107.

<sup>4</sup> Rodgers, C, Defining reflection: Another look at John Dewey and reflective teaching. *Teachers College Record*, 104 no 4 (2002)., 842-866.

<sup>5</sup> Farrell, T. TESOL, a profession that eats its young! The importance of reflective practice in language teacher education. *Iranian Journal of Language Teaching Research*, 4 no 3, (2016a). 97-107.

<sup>6</sup> Mathew, P., & Peechattu, P, Reflective practices: A means to teacher development. *Asia Pacific Journal of Contemporary Education and Communication Technology*, 3 no 1, (2017). 126-131

<sup>7</sup> Yalcin Arslan, F. The role of lesson study in teacher learning and professional development of EFL teachers in Turkey: A case study. *TESOL Journal*, 10 no 2 (2019). 1-13.

<sup>8</sup> Ponsawa S & Sumalee C, Reflective Practice in Teacher Education: Issues, Challenges, and Considerations. *PASAA*, 62, (2021). 237-264

<sup>9</sup> Walkington, J, Becoming a teacher: encourage development of teacher identity through reflective practice. *Asia-Pacific Journal of Teacher Education*, 33 no 1 (2005). 53-64.

instructional methods and to assess the levels of reflective thinking exhibited by these teachers. By understanding the impact of reflective practices on teachers' professional practices, this research aims to contribute to the broader discourse on teacher professional development in Ghana and provide insights into the effectiveness of reflective practices in improving teaching quality.

Reflective practice is a concept that has evolved over centuries, with early contributions from John Dewey, who first linked reflection to action in the early 20th century. Dewey's work laid the foundation for modern reflective practice, which was further expanded by Schön<sup>10</sup>. According to Schön, reflection can take place before, during, and after teaching, allowing teachers to evaluate their actions, improve their teaching strategies, and develop a deeper understanding of their practices. Reflective practice has since become a cornerstone of teacher professional development, particularly in education systems that seek to improve teaching quality and student learning outcomes<sup>11</sup>.

In Ghana, reflective practice has been integrated into the national educational curriculum, particularly through initiatives such as the Transforming Teacher Education and Learning (T-TEL) project<sup>12</sup>. This initiative highlights the importance of reflection in teacher development and aims to create reflective practitioners who can adapt to the demands of the modern classroom. Reflective practice allows teachers to critically evaluate their teaching methods and modify them to better meet the needs of their students, resulting in improved teaching quality and enhanced student learning outcomes<sup>13,14</sup>.

Several models of reflective practice have been proposed to guide teachers through the reflective process. One widely known model is Kolb's<sup>15</sup> Experiential Learning Cycle, which consists of four stages: concrete experience, reflective observation, abstract conceptualization, and active experimentation. This model encourages teachers to engage in a continuous cycle of experience, reflection, theory-building, and practice, thereby fostering lifelong learning. Another popular model, proposed by Rolfe, Freshwater, and Jasper<sup>16</sup>, involves three key questions to guide reflection: "What? So what? Now what?" These questions help teachers summarize their experiences, assess their significance, and plan for future actions. Additionally, frameworks such as Gibbs' Reflective Cycle<sup>17</sup>

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<sup>10</sup> Schon, D. A. (1983). *The Reflective Practitioner: How Professionals think in Action*. New York: Basic Books.

<sup>11</sup> Zeichner, K. & Liston, D. (1996). *Reflective teaching: An Introduction*. Mahwah, NJ: Lawrence Erlbaum Associates (1996).

<sup>12</sup> Apau, S. K. & Dampson, D. G. (2019). The Teacher in the Mirror: The reflective practices of Basic School Teachers in the Central Region of Ghana. *Asian Journal of Interdisciplinary Research*, 2(1), 35-47

<sup>13</sup> Yalcin Arslan, F. (2019). The role of lesson study in teacher learning and professional development of EFL teachers in Turkey: A case study. *TESOL Journal*, 10(2), 1–13.

<sup>14</sup> Ponsawa S & Sumalee C, (2021). Reflective Practice in Teacher Education: Issues, Challenges, and Considerations. *PASAA*, 62, 237-264

<sup>15</sup> Kolb, D.A. (1984). *Experiential Learning*. New Jersey, EnglewoodCliffs: Prentice Hall.

<sup>16</sup> Rolfe, G., Freshwater, D., & Jasper, M. (2001). *Critical Reflection for Nursing and the Helping Professions: A user's guide*. London: Palgrave Macmillan.

<sup>17</sup> Gibbs, G. (1988). *Learning by doing: A guide to teaching and learning methods*. Oxford Further Education Unit: Oxford.

and Korthagen and Vasalos' Onion Model <sup>18</sup> have been adopted to support teachers in their reflective practice, offering structured approaches to guide their self-assessment and professional growth.

Reflective practice is not only essential for improving teaching practices but also for enhancing teachers' professional identity and development. Teachers who engage in deeper forms of reflection are better able to identify areas for improvement, adopt new teaching strategies, and challenge their existing assumptions about teaching and learning <sup>19</sup>. This process helps them to become more adaptive and responsive to the needs of their students, ultimately contributing to the development of more effective teaching practices. In Ghana, this is particularly relevant as teachers face diverse classroom challenges, including limited resources, large class sizes, and varying student needs. Reflective practice allows teachers to adapt their teaching methods to address these challenges, thereby improving student engagement and learning outcomes <sup>20</sup>.

As the Ghanaian educational system continues to evolve, reflective practice remains a key tool for improving teacher quality and ensuring the successful implementation of the new curriculum. However, while reflective practice has been widely promoted in teacher education, there is still limited research on its actual impact on teaching practices in Ghanaian high schools. This gap in knowledge underscores the need for research that evaluates how reflective practice influences science teachers' professional practices and whether it contributes to improved teaching and learning outcomes in the classroom.

This study aims to assess the impact of reflective practice on the professional practices of science teachers in selected Senior High Schools and Senior High Technical Schools in Ghana. By examining the influence of reflective practice on teachers' instructional methods and the levels of reflective thinking exhibited by these teachers, this research will provide valuable insights into the effectiveness of reflective practice in improving teacher quality and enhancing student learning outcomes in Ghanaian high schools.

## Method

This study adopted a mixed-methods research design, incorporating both quantitative and qualitative approaches, with a case study design to evaluate the impact of reflective practice on science teachers' professional practices. The research targeted science teachers from two Senior High Schools and one Senior High Technical School in the central region of Ghana. A purposive sampling technique

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<sup>18</sup> Korthagen, F., & Vasalos, A. (2005). Levels in reflection: Core reflection as a means to enhance professional growth. *Teachers and Teaching*, 11(1), 47–71.

<sup>19</sup> Dervent, F. (2015). The effect of reflective thinking on the teaching practices of preservice physical education teachers. *Issues in Educational Research*, 25(3), 260-275.

<sup>20</sup> Jensen, E. (2009). *Teaching with Poverty in Mind*. ASCD: Alexandria, VA.

was used to select 51 science teachers from these schools. The selection was based on two criteria: participation in reflective practice training during their pre-service education and being the sole science teacher at their respective schools. These schools represent different educational settings: urban, peri-urban, and rural. The sample consisted of teachers specializing in Chemistry (26%), Biology (25%), Physics (17%), and Integrated Science (32%). All participants had been trained in reflective practices during their pre-service education at universities and continuous professional development programs.

The primary objective of the professional development program was to help teachers use reflection to improve their professional practices and foster transformative learning within their classrooms. To assess the impact of reflective practice on teachers' professional practices, participants were observed over the course of one semester. The study focused on how these teachers reflected on their professional practices in science subjects, particularly for all lessons planned and taught during the semester.

### ***Data Collection***

Data were collected using two instruments: the Teaching Evaluation Instrument Guide (TEIG) and a structured questionnaire. The TEIG was employed to assess teachers' reflections on their professional teaching standards throughout the study period. This instrument included four sections that corresponded to the four professional practice standards outlined by Danielson<sup>21</sup>, covering 21 descriptive factors. The structured questionnaire, adapted from Kember et al.<sup>22</sup>, was used to measure the impact of reflection on the teachers' professional practices and to assess the levels of reflective thinking exhibited by participants. The questionnaire had four categories: habitual action, understanding, reflection, and critical reflection, which helped determine the participants' reflective thinking levels. The results from the confirmatory factor analysis indicated a strong fit for the four-factor model<sup>23</sup>. Additionally, participants' written reflections on their lessons were collected in response to three guiding prompts: "What experience are you reflecting on?", "So why?", and "Now what next for the future?" Extra written reflections were also gathered for qualitative analysis.

### ***Data Analysis***

The analysis of written reflection data followed a systematic process. Initially, the teacher-written reflections were read to gain an overall understanding and identify recurring ideas. These reflections were then coded to identify key phrases and grouped into broader categories. Emerging patterns and themes were refined by merging or splitting categories as necessary, and validation was conducted by checking the data against the original written reflections.

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<sup>21</sup> Danielson, C. (2013). A framework for teaching evaluation instrument. The Danielson Group. <https://www.danielsongroup.org/framework/>

<sup>22</sup> Leung, D. Y. P. and D. Kember. The relationship between approaches to learning and reflection upon practice. *Educational Psychology* 23, no. 1(2003): 61–71

<sup>23</sup> Leung, D. Y. P. and D. Kember. The relationship between approaches to learning and reflection upon practice. *Educational Psychology* 23, no. 1(2003): 61–71

The level of reflection was assessed using a four-category outline derived from Kember et al.'s<sup>24</sup> framework for coding reflective thinking, which includes Habitual Action, Understanding, Reflection, and Critical Reflection. The analysis aimed to identify the depth of teachers' reflections based on their professional practice.

1. Habitual Action: Teachers' reflections at this level focused on the “how” and “why” of their teaching practices without deeper personal engagement or application to real-life experiences.
2. Understanding: Reflections at this level involved teachers attempting to understand and accurately report teaching content without personal responses or connections to broader experiences.
3. Reflection: At this stage, teachers reflected on their teaching and related it to their personal experiences and practical application in the classroom.
4. Critical Reflection: The highest level of reflection, where teachers transformed their perspectives by integrating new information, beliefs, and experiences, which influenced their teaching practice and approach to learners.

Each of these levels was scored and analyzed to determine the depth of teachers' reflective thinking. Written reflections were categorized and evaluated based on the professional practice standards outlined by Danielson<sup>25</sup>, including planning and preparation, classroom environment, instruction, and professional responsibilities.

### ***Statistical Analysis***

Descriptive statistics, including frequencies and percentages, were used to summarize the data collected from the TEIG and the structured questionnaires. The results were presented in tabular form to highlight the frequency of each level of reflection among the participants. Additionally, qualitative data from the teachers' written reflections were analyzed thematically, and excerpts from the reflections were included in the results section to provide supporting evidence for the descriptive data.

The impact of reflective practice on teachers' professional practices was assessed using Danielson's framework to evaluate the teachers' performance in the four competency areas. Each category was examined in detail to determine the specific impact reflective practice had on enhancing professional competencies in planning, classroom management, instruction, and professional responsibility.

The methodology of this study incorporated both quantitative and qualitative data collection and analysis techniques to comprehensively assess the impact of reflective practice on science teachers'

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<sup>24</sup> Leung, D. Y. P. and D. Kember. The relationship between approaches to learning and reflection upon practice. *Educational Psychology* 23, no. 1(2003): 61–71

<sup>25</sup> Danielson, C. (2013). A framework for teaching evaluation instrument. The Danielson Group. <https://www.danielsongroup.org/framework/>.

professional practices. By combining structured questionnaires, reflective writing, and detailed analysis of teaching practices, this research provides valuable insights into how reflective practice influences teacher development and classroom effectiveness in the Ghanaian context.

## Result and Discussion

This section presents the general findings of the study, including demographic details, the reflection levels of teachers on the four professional teaching standards, and their overall levels of reflective practice. The data were collected from 51 science teachers across two Senior High Schools and one Senior High Technical School in the central region of Ghana, representing urban, peri-urban, and rural educational settings.

### *Demographic Information*

The demographic breakdown of the participating teachers, including gender and years of teaching experience, is shown in Table 1. Out of the 51 science teachers, 80.4% were male and 19.6% were female. Regarding teaching experience, 17.6% of the teachers had 0-3 years of experience, 43.2% had 4-6 years, and 39.2% had more than 7 years of teaching experience. These results suggest that the majority of the participants were experienced teachers, with most having taught for 4 years or more.

Table 1: Participants Demographic Information

Variable	Descriptive Factor	Number of Teachers (n)	Percentage (%)
Gender	Female	10	19.6
	Male	41	80.4
Year of Teaching	0 – 3	9	17.6
	4 – 6	22	43.2
	7 years and above	20	39.2
Number of Participants		51	100

### *Reflection on Professional Standards*

Teachers' reflections on the four professional teaching standards (Planning and Preparation, Instruction, Classroom Environment, and Professional Responsibility) were assessed using the frequency of reflections within the study period. The ratings for each professional standard were categorized as: Low (0-39%), Average (40-69%), and High (70-100%).

Table 2: Professional Teaching Standards and Competencies Reflected

Professional Standard	Descriptive Factor	Number of Teachers (n)	Percentage (%)	Average % (Frequency)
Planning and Preparation	Exhibit knowledge of content and pedagogy	41	80	59% (179)
	Demonstrate knowledge of learner	20	40	
	State clear instructional outcomes	38	75	

Instruction	Demonstrate knowledge of resources	41	80	69% (174)
	State appropriate instructions	34	67	
	Design learner assessment	5	10	
	Demonstrate flexibility and responsiveness	43	85	
	Effective communication with students	35	69	
	Involve learners in learning objectives	40	79	
	Using questions and answers techniques	46	90	
	Integrate assessment of instruction	10	20	
Classroom Environment	Create a culture for learning	15	30	44% (112)
	Manage classroom procedure	31	60	
	Manage learner behavior	26	50	
	Create respect and rapport environment	20	40	
Professional Responsibility	Manage physical space in class	20	40	39% (99)
	Exhibiting professionalism	29	56	
	Keeping accurate records	0	0	
	Participating in professional community	46	90	
	Reflecting on teaching and learning	5	10	
	Family partnership	19	38	

### ***Planning and Preparation:***

The highest frequency of reflection (179) was observed in the Planning and Preparation professional standard, with 59% of teachers reflecting on it regularly. The competencies of knowledge of content and pedagogy, instructional outcomes, and knowledge of resources were highly reflected, with teachers frequently noting the importance of using teaching-learning materials (TLM) for clearer concept delivery. However, the competency related to Designing learner assessment was poorly reflected (10%), indicating that assessment was a weak area for the teachers.

### ***Instruction:***

Reflection on the Instruction standard showed an average impact (69%) but still rated as important. The highest levels of reflection were noted in question and answer techniques (90%), where



teachers reflected on how they used questioning to gauge student understanding. On the other hand, reflection on Integrating assessment of instruction was low (20%), indicating that teachers faced challenges in reflecting on and integrating assessments into their teaching.

### ***Classroom Environment:***

This standard was reflected at an average level (44%). While classroom management (60%) and learner behavior management (52%) were moderately reflected, the competencies of creating a culture for learning (30%) and managing physical space (38%) were poorly reflected, suggesting that teachers struggled with fostering an optimal learning environment.

### ***Professional Responsibility:***

Reflection on professional responsibility was the lowest across all standards, with only 39% of teachers reflecting on this area. The highest reflection (90%) was seen in participating in professional community. However, competencies such as keeping accurate records (0%) and reflecting on teaching and learning (10%) were almost entirely neglected.

### ***Levels of Reflection***

The levels of reflection among the teachers were analyzed based on four categories: Habitual Action/Non-Reflection, Understanding Reflection, Reflection, and Critical Reflection. The data revealed the following distribution:

Table 3: Participants' Level of Reflection

Level of Reflection	Number of Teachers (n)	Percentage (%)
Habitual Action/Non-Reflection	21	42
Understanding Reflection	25	49
Reflection	5	9
Critical Reflection	0	0
Total	50	100

The results show that 42% of the teachers exhibited Habitual Action/Non-Reflection, suggesting that nearly half of the participants reflected at a superficial level or not at all. Approximately 49% demonstrated Understanding Reflection, indicating that they reflected on teaching practices but without deep personal engagement or transformation. Only 9% of the teachers reflected at the Reflection level, with none reaching the Critical Reflection level. The lack of teachers reflecting at the highest level, Critical Reflection, suggests a significant opportunity for growth in teachers' reflective practices, which could have a direct impact on improving teaching quality and student outcomes.

While the study indicates that teachers engage in reflective practices across all four professional standards, there is room for improvement, particularly in fostering deeper, more transformative forms of reflection. The absence of Critical Reflection among the participants points to a gap that needs to

be addressed to enhance teacher development and ultimately improve educational outcomes in Ghana's high schools.

## Discussion

This study aimed to assess the impact of reflective practice on science teachers' professional standards and competencies, as well as to evaluate their levels of reflective practice within the context of Senior High Schools and Senior High Technical Schools in Ghana. The findings revealed varying levels of engagement with reflective practice across the four key professional teaching standards: Planning and Preparation, Instruction, Classroom Environment, and Professional Responsibility. Overall, the results indicate that while teachers were engaged in reflective practice, the depth and breadth of this engagement varied significantly across the different standards.

The findings suggest that Planning and Preparation was the most frequently reflected upon by teachers, with 59% of participants reflecting on this area. This outcome aligns with previous research, which indicates that teachers are generally more inclined to reflect on aspects of teaching that directly impact lesson planning and instructional strategies <sup>26</sup>. The high frequency of reflection on competencies such as content knowledge, instructional outcomes, and the use of resources indicates that teachers place considerable importance on preparing lessons effectively. However, the relatively low reflection on learner assessment (10%) suggests that teachers may lack the necessary tools or training to adequately reflect on this critical aspect of teaching, which can hinder the development of comprehensive teaching practices. This finding is consistent with previous studies that point to teachers' struggles with assessing student learning in ways that inform instructional decisions .

Regarding Classroom Environment, the results revealed an average impact of reflective practice, with 44% of teachers reflecting on this standard. Although classroom management and learner behavior were the most frequently reflected upon, other competencies, such as creating a culture for learning and managing physical space, were less frequently addressed. These findings align with Jensen <sup>27</sup>, who emphasized that creating a positive classroom climate requires teachers to consistently engage in reflective practices that promote effective classroom management. However, the limited reflection on fostering a learning culture and managing physical space suggests that teachers may not fully recognize the importance of these competencies in creating an optimal learning environment. This gap in reflective practice could be detrimental to student engagement and learning outcomes, as an effective classroom environment is essential for academic success <sup>28</sup>.

In terms of Instruction, the study found this professional standard to be the most frequently reflected upon, with an average reflection rate of 69%. Competencies related to questioning techniques, flexibility, and learner involvement were particularly well-reflected. This is in line with the

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<sup>26</sup> Zeichner, K. & Liston, D, *Reflective teaching: An Introduction*. (1996). Mahwah, NJ: Lawrence Erlbaum

<sup>27</sup> Jensen, E, *Teaching with Poverty in Mind*. (2009). ASCD: Alexandria, VA

<sup>28</sup> Harland, D. & Wondra, J. Preservice teachers' reflections on Clinical Experiences: A comparison of blog and final paper assignments. *Journal of Digital Learning in Teacher Education*, 27 no 4, (2011). 128-135

findings of Lawrence-Wilkes and Ashmore <sup>29</sup>, who highlighted the significant role that reflective practice plays in enhancing teaching strategies and fostering student-centered learning environments. However, the low reflection on assessment during instruction (20%) suggests that teachers may still struggle to integrate ongoing formative assessment into their teaching. This could be due to a lack of training in assessment strategies or a reliance on summative assessments, as observed in previous studies <sup>30</sup>.

The Professional Responsibility standard showed the weakest reflection, with only 39% of teachers reflecting on this area. Although participation in professional communities was highly reflected (90%), other competencies such as keeping accurate records (0%) and reflecting on teaching and learning (10%) were poorly reflected upon. This finding is concerning, as maintaining accurate records is critical for tracking student progress and informing instructional decisions <sup>31</sup>. The lack of reflection on this competency could limit teachers' ability to evaluate the effectiveness of their teaching and adjust their strategies accordingly. Moreover, the low level of reflection on teaching and learning outcomes suggests that teachers may not fully engage in the critical process of evaluating the impact of their teaching practices on student learning.

The study also examined the levels of reflective practice among the teachers. The majority of teachers were found to reflect at the Habitual Action or Understanding Reflection levels (42% and 49%, respectively), with only 9% reaching the Reflection level and none reaching the Critical Reflection level. This finding is consistent with the research of Farr and Riordan <sup>32</sup>, who noted that many teachers engage in superficial forms of reflection that focus on surface-level aspects of their teaching. The lack of Critical Reflection is particularly concerning, as it suggests that teachers may not be critically evaluating their teaching practices or engaging in deep, transformative learning. The absence of Critical Reflection could hinder teachers' ability to adapt and improve their teaching methods, ultimately affecting student outcomes.

Several factors may contribute to the low levels of reflection, particularly the absence of Critical Reflection. As suggested by Harland and Wondra <sup>33</sup>, barriers such as inadequate training, heavy workloads, and negative perceptions of reflection as a burdensome task could prevent teachers from engaging in deeper forms of reflection. Additionally, the lack of institutional support and the absence of dedicated time for reflection may further hinder teachers' ability to engage in meaningful reflective

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<sup>29</sup> Lawrence-Wilkes, L. & Ashmore, L, *The Reflective Practitioner in Professional Education*, (2014). Basingstoke: Palgrave Macmillan.

<sup>30</sup> AssociatesChoy, S. C., & Oo, P. S. (2012). Reflective thinking and teaching practices: A precursor for incorporating critical thinking into the classroom. *International Journal of Instruction*, 5: 167-182

<sup>31</sup> Sellars, M. (2014). *Reflective practice for teachers*. Los Angeles: SAGE.

<sup>32</sup> Farr, F., & Riordan, E. Tracing the reflective practices of student teachers in online modes. *ReCALL: Journal of Eurocall*, 27 no 1 (2015). 104-123

<sup>33</sup> Harland, D. & Wondra, J. Preservice teachers' reflections on Clinical Experiences: A comparison of blog and final paper assignments. *Journal of Digital Learning in Teacher Education*, 27 no 4, (2011). 128-135

practice. Addressing these barriers is crucial for fostering a culture of reflection that supports professional growth and improves teaching effectiveness.

### ***Implications for Educational Development***

Reflective practice is essential for teachers' professional development and for the successful implementation of new curricula. This study highlights the need for targeted support to improve reflective practices among teachers, particularly in areas such as assessment, classroom environment, and professional responsibility. The findings underscore the importance of providing teachers with the skills, motivation, and tools necessary to engage in meaningful reflection. This support could include professional development programs, mentoring, and creating a culture that values reflection as a critical component of teaching.

Furthermore, the results indicate that Critical Reflection is a key area for development. Teachers who engage in critical reflection are better able to adapt their teaching methods, address challenges in the classroom, and ultimately improve student learning outcomes<sup>34</sup>. Therefore, it is crucial for teacher education programs and professional development initiatives to focus on cultivating higher levels of reflection, particularly critical reflection, to enhance teaching quality and ensure successful curriculum implementation.

The limitations of this study must be considered when interpreting the results. The sample size of 51 teachers may not be representative of all high school science teachers in Ghana or other regions, limiting the generalizability of the findings. Additionally, the reliance on written reflections may have limited the depth of teachers' responses, as some may have been hesitant to fully express their thoughts due to concerns about confidentiality or judgment. Furthermore, social desirability bias may have influenced teachers to present themselves in a more positive light, potentially overestimating the impact of reflective practice. Finally, the study focused only on teachers' reflections and did not account for other factors that may influence teaching effectiveness, such as classroom resources, student engagement, or school leadership.

This study provides valuable insights into the impact of reflective practice on teachers' professional standards and competencies in Ghana. It highlights the need for further support and development in reflective practices, particularly in areas such as assessment, classroom environment, and professional responsibility. Addressing the barriers to effective reflection and promoting Critical Reflection will be essential for improving teaching quality and ensuring the successful implementation of curricula in Ghana's high schools.

### **Conclusion**

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<sup>34</sup> Lawrence-Wilkes, L. & Ashmore, L, *The Reflective Practitioner in Professional Education*, Basingstoke: Palgrave Macmillan(2014)

This study explored the impact of reflective practice on teachers' professional practices and the levels of reflection exhibited by science teachers in Senior High Schools and Senior High Technical Schools in Ghana. The findings reveal that reflective practice had an average impact on three of the four professional standards—Planning and Preparation, Instruction, and Classroom Environment—while the Professional Responsibility standard was less impacted. This suggests that while teachers engage in reflective practice in certain areas, there is a noticeable gap, particularly in professional responsibilities, such as record-keeping and reflecting on teaching and learning outcomes.

Additionally, the study showed that many teachers did not regularly reflect on key professional competencies. This limited engagement with reflective practice can be attributed to factors such as the perception of reflection as tedious or unnecessary, and a lack of motivation to engage in continuous reflection after formal training. Teachers often viewed reflection as a burdensome task, rather than a valuable tool for improving their teaching and enhancing student learning.

Furthermore, the study highlighted that none of the participants reached the highest level of reflection, Critical Reflection, which is vital for transformative teaching and learning. This gap indicates that there are barriers preventing teachers from engaging in deeper reflection, such as inadequate training, insufficient time, and lack of institutional support. The absence of Critical Reflection among the teachers also suggests missed opportunities for growth and professional development.

These findings emphasize the need for more structured support and targeted interventions to improve reflective practices among teachers. To address these issues and enhance the impact of reflective practice on teaching standards, this study recommends the following steps for high schools:

1. **Focus on Critical Reflection:** Professional development programs should emphasize Critical Reflection, helping teachers engage in deeper, transformative thinking about their teaching practices. This could involve training on how to reflect critically on teaching experiences and how to apply those reflections to improve classroom practices.
2. **Provide Structured Reflection Opportunities:** Schools should dedicate time for both individual and collaborative reflection, allowing teachers to engage in meaningful reflection regularly. This could include scheduled reflection sessions during professional development days or collaborative group reflections on teaching practices.
3. **Integrate Reflective Practice into Teacher Evaluations:** Reflective practice should become a key component in teacher evaluations, alongside performance and student outcomes. By formally recognizing and rewarding reflective practices, schools can incentivize teachers to reflect regularly and intentionally on their work.
4. **Offer Rewards for Reflective Engagement:** Schools should consider offering rewards and recognition for teachers who consistently engage in reflective practices and demonstrate growth in their teaching methods. This could include recognition through professional development credits, career advancement opportunities, or other incentives.

The implications of this research extend beyond the immediate findings. By fostering an environment that prioritizes reflective practice, schools can improve teaching quality, support teacher growth, and ultimately enhance student learning outcomes. Future research could explore the barriers teachers face in engaging in Critical Reflection and the effectiveness of structured professional development programs designed to overcome these challenges. Additionally, studies could examine how reflective practices vary across different subject areas and educational levels, providing a broader understanding of how reflection contributes to overall educational improvement.

This study underscores the critical role that reflective practice plays in improving professional standards and competencies. By addressing the gaps in reflection and providing the necessary support, schools can empower teachers to enhance their practice, which will ultimately benefit student achievement and contribute to the development of a more effective and transformative educational system.

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