

# The effect of teacher motivation and instructional methodologies on student outcomes in integrated science in the Upper East region, Ghana

Issah Ibrahim, Professor John K. Eminah, Collins Owusu-Fordjour, Stephen Oware Afram and Valantine Baalongbuoro

Science Department, Methodist College of Education, Akim Asene – Abuobo Oda- Ghana. Senior Lecturer Department of Science Education, University of Education, P.O. Box 25, Winneba. Department of Integrated Science Education. University of Education, Winneba. P.O. Box 25, Winneba – Ghana Science Department, Methodist College of Education, Akim Asene – Abuobo Oda- Ghana and Queen of Peace Senior High School, P. O. Box 27, Mayfield, Upper West Region- Ghana. Corresponding Authors Email: [isquare1980@gmail.com](mailto:isquare1980@gmail.com)

## ABSTRACT

*This study's focus was to ascertain how teaching strategies and teacher motivation affected students' performance in integrated science in Ghana's Upper East. The researcher employed a survey design. Heads of senior high schools and teachers of integrated science constitute the study's population. Purposeful and straightforward random samplings were utilised to choose the respondents. 84 respondents made up the sample, comprising 80 integrated science teachers and 4 school heads. A structured questionnaire served as the primary tool, and the Statistical Package for Social Sciences was used to analyse the data (SPSS).*

*The data analysis revealed that a large percentage of integrated science instructors (52.5%) thought that teacher motivation led them to perform in-depth study in order to teach effectively. Additionally, it was found that every integrated science instructor stated that skilled teachers employ effective teaching strategies to raise student achievement.*

**Keywords:** Instructional Approaches, Motivation, and Integrated Science

## INTRODUCTION

The efficacy of teachers' educational strategies is backed up by scientific data. As efficient methods of teaching support learning of novel ideas or concepts, ineffective strategies restrict comprehension skills as well as application (Chang, 2010). As a result, teachers should adapt their instructional approaches to the requirements and needs of their pupils in order to ensure effective learning and achievement. When learning styles and teaching methods clash, students are less likely to become engaged in the material, which can lead to some of them dropping out entirely (Odundo, 2003; Zeeb, 2004). Chang (2010) looked at the effect of learner- and teacher-centered educational practises on academic attainment in a second study. According to the study, learner-centered approaches were more efficient at achieving learning outcomes and efficiency in addressing global concerns, as well as in influencing learners' perceptions of science classes through active participation in the learning. When using learner-centered teaching strategies, some teachers only serve to assist the

## ***The effect of teacher motivation and instructional methodologies on student outcomes in integrated science in the Upper East region, Ghana***

teaching process (Ahmad & Aziz, 2009). Conversations and academic engagement are connected to a better process using learner-centered techniques (Ministry of Education, 2001; Eken, 2000; Curtin, 2005; Froyd, 2007; Ahmad & Aziz, 2009). Regardless of the idea that teachers are allowed to choose how they train their learners, Chika (2012) states the learner-centered approach is a potent method for enhancing learning accomplishment in tests and applications of the knowledge and abilities that have been taught.

Student participation in group discussions was regarded more by them than attending lectures. Kang'ahi, Indoshi, Okwach, and Osodo (2012) examined how teaching strategies affected students' proficiency in the Kiswahili language in secondary schools in Kenya. The research discovered a link between teaching strategies and student performance. Additionally, it was shown that employing more learner-centered teaching strategies improved student accomplishment. Additionally, Muraya and Kimano (2011) found that compared to a standard teaching technique (teacher-centered), a cooperative learning (learner-centered) strategy produced considerably higher mean achievement scores.

Learner-centered approaches also actively include students in the learning process to ensure that they fully comprehend the subject matter and that a positive attitude toward the subject is promoted. In order to improve students' inventive, crucial, and creative abilities, instructional practises should make learning more learner-centered. This is according to the National Report on the Development of Kenyan Education, which was presented at the International Conference on Education in September 2001. Ministry of Education Teachers serve as facilitators in a learner-centered classroom, where students take the initiative in conversations (2001). Tella, Indoshi, and Othuon (2010) contend that teacher-centered approaches frequently lead to students loathing their lessons and failing to profit from intellectual inquiry.

It should be mentioned that student pedagogy is an interactive teaching method that incorporates small group activities, question presentation, and facilitation within classroom settings. The use of technology in the classroom and student involvement in fieldwork projects are two more instances of interactive pedagogy. Additionally, interactive teachers promote active engagement from all students and cater to a range of learning styles while helping them to strengthen their specific areas of weakness (Curtin, 2005). Additionally, teachers encourage students to define issues, conduct dialogues, and ask questions (Chika, 2012). Additionally, these techniques link what students learn in the classroom to their daily lives (Bush, 2006; Kumar, 2006). Learner-centered approaches have various advantages, including enhancing performance, encouraging critical thinking, and addressing students' communication needs (Cummins, 2007). According to Chika (2012), teacher-centered pedagogy is less effective at enhancing learning outcomes than interactive techniques.

In primary, secondary, and college settings, it has been noted that one of the variables impacting academic performance through study effort is motivation (Vansteenkiste, 2005). Fenech (2006) found a number of variables, such as bad working conditions, low pay, high workloads, improper managerial expectations, low professional standing, and limited autonomy, that significantly contribute to teacher unhappiness.

Effective learning is assumed to be influenced by teachers' commitment to education and their impact on student achievement. Additionally, researchers (Sandra, 2002; Skaalvik & Skaalvik, 2006) found a connection between motivation and academic achievement. If teacher incentives are successful in bringing social goals and student goals together, student performance may improve. In this instance, the incentive and composition

## *The effect of teacher motivation and instructional methodologies on student outcomes in integrated science in the Upper East region, Ghana*

effects will work together to improve student performance (Lazear, 2003). There have been few studies done in Ghana on the variables that affect student accomplishment, including the school atmosphere, instructional materials, and the efficiency of utilising the allowed teaching time. These studies, however, haven't looked at teaching methods or teacher inspiration in Ghana's Upper East. To determine how teaching techniques and instructor motivation impact academic outcomes is the goal of the inquiry.

### **METHODOLOGY**

This study involves the use of statistical survey. Four (4) school heads and eighty (80) integrated science teachers were representative of the accessible population. The teachers were selected at random, whereas the school heads were selectively drawn from the sampled schools. The selection process for the teachers was giving out cards to each one regardless of what was written on them, and those whose cards said "chosen" were selected. The study used questionnaires for teachers and school head teachers Data was gathered through giving questionnaires to participants. Additionally, the acquired data were edited, encoded, and analysed using SPSS version 20.0, which stands for Statistical Package for Social Sciences. To increase the instruments' content validity, my colleagues looked through them. They evaluated the tools, offered suggestions for improvement, and those suggestions were put into practise. The instruments also underwent face-validation analysis. A reliability test was run using the Cronbach's alpha formula. Using Cronbach's alpha, the coefficient of reliability was determined to be 0.982.

### **RESULTS AND DISCUSSION**

**Table 1: displays the respondents' gender**

<b>Sex</b>	<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>
MALE	50	59.5	59.5
FEMALE	34	40.5	40.5
Total	84	100.0	100.0

Source: Field work 2016

Table 1 shows that 40.5%(34) of the respondents were female and 59.5%(50) of the respondents were male. Gender issues are a significant factor to take into consideration in both men and women's education due to traditional ideas and prejudices held by individuals regarding the roles, jobs, and participation of women in society (UNESCO, 2006). This could support the widespread belief that some academic areas, including science, are frequently seen as "masculine" subjects (FAWE, 2004). In light of this, the gender distribution of the sample of respondents for this study was of interest.

*The effect of teacher motivation and instructional methodologies on student outcomes in integrated science in the Upper East region, Ghana*

**Table 2 illustrates the respondents' age groups.**

<b>Age Range</b>	<b>Frequency</b>	<b>Percent</b>
23-30years	10	11.9
31-40years	50	59.5
41-50years	15	17.9
above 50years	9	10.7
<b>Total</b>	<b>84</b>	<b>100.0</b>

Source: Field work, 2016

11.9% (10) of the 84 respondents came from people under the age of 23, 59.5% (50) from people between the ages of 31 and 40, 17.9% (15) from people between the ages of 41 and 50, and 10.7% (9) from those above 50. This suggests that the age distribution, especially in the schools under study, suggests that a sizable majority of the teachers were young (31–40), which may have resulted in effective productivity. Due to the retirement of teachers in the area, it was assumed that a lack of respondents, particularly integrated science instructors, was improbable. Furthermore, those who responded had higher knowledge of how instructional strategies and teacher motivation affect students' performance when they were between the ages of (41 years and above 50 years). Respondents were prompted to answer questions on their marital status. This is illustrated in Table 3.

**Table 3 clearly indicates the marital status of the participants.**

<b>Marital Status</b>	<b>Frequency</b>	<b>Percent</b>
Married	69	82.1
Single	11	13.1
Widowed	4	4.8
<b>Total</b>	<b>84</b>	<b>100.0</b>

Source: Field work, 2016

82.1%(69) of the 84 responses were married; the other 13.1% (11) were single; and the remaining 4.8% (4) were widowed. This suggests that married persons were viewed as being more responsible, mature, and well-adjusted than unmarried people, especially those who were not in a romantic relationship. Based on the aforementioned, single people may experience prejudice in recruiting practises since they may be viewed as less dedicated to their professions and less likely to succeed as employees than married people. The respondents were asked for details regarding their educational histories.

**Table 4: Levels of Education of Survey participants**

<b>Qualifications</b>	<b>Frequency</b>	<b>Percent</b>
Diploma	8	9.5
Bachelor's degree	70	83.3
Master's degree	6	7.2
<b>Total</b>	<b>84</b>	<b>100.0</b>

Source: Field work, 2016

9.5% (8) of the 84 respondents had a high school diploma, 83.3% (70) had a bachelor's, and the final 7.2% (6) had a master's. The responders were all graduates of some level of formal higher education. The respondents were able to understand and respond to the questionnaire well because of their qualifications. In Senior High Schools, pupils do better academically when taught by teachers with more than 10 years of experience, according to Tremblay, Ross, and Berthelot (2001). The findings in Table 5 show that the range of teaching experience was from 1 to more than 15 years. According to Table 5, the researcher gave the respondents the chance to share their work experience.

**Table 5 displays the previous work experience of the respondents.**

<b>Years of experience</b>	<b>Frequency</b>	<b>Percent</b>
1-5years	4	4.8
6-10years	15	17.9
11-15years	50	59.5
above 15years	15	17.8
<b>Total</b>	<b>84</b>	<b>100.0</b>

Source: Field work, 2016

According to Table 5, 4.8%(4) of respondents have taught for between one and five years, 17.9%(15) for between six and ten years, 59.5%(50) for between eleven and fifteen years, and 17.8%(15) for over fifteen years. Since the majority of respondents are likely to have relevant work experience and familiarity with their schools, they can provide accurate information about them. According to Bandura (1997), teachers with greater experience are more confident and self-effective in handling students' learning difficulties. The bulk of the respondents have between eleven and fifteen years of work experience, which puts them in a better position to provide the researcher with their views and experiences related to instructional strategies and teacher motivation.

What effects does a teacher's motivation have on the lessons they teach in the classroom?

The participants were asked about how much teacher motivation affects students' academic success. The responses to the survey are shown in Table 6.

*The effect of teacher motivation and instructional methodologies on student outcomes in integrated science in the Upper East region, Ghana*

**Table 6: The level of motivation among teachers**

Statement	SA	AA	UC	DA	SD
i. In my school, teachers are incentivized frequently..	7	44		33	0
ii. Teachers are given meals..	18	60		6	0
iii. There are accommodations for teachers at the school.	2	8		60	14
iv. The school head is concerned for the welfare of the instructors.	1	33		47	3
v. At least once a year, motivational excursions and retreats are scheduled..	0	0		73	11

Source: Field work, 2016; SA= Strongly Agree; AA = Agree; UC =Undecided; DA = Disagree; SD = Strongly

Disagree

To demonstrate the extent to which teachers are motivated

To ascertain the degree of teacher motivation, school heads and integrated science teachers were polled. 8.33% (7) of the 84 respondents strongly concur, 52.38% (44) agree, and 39.29% (33) disagree that teachers at their school are frequently motivated. Of the 84 respondents, 21.43% (18) strongly agreed that teachers should receive meals, compared to 71.4% (60) who agreed and 6.14% (6) who opposed. the 84 participants made up the following proportions: The school has accommodations for teachers' living, according to 2.38%(2) strongly agree, 9.52%(8) agree, 71.43%(60) disagree, and 16.67%(14) strongly disagree. 1.19%(1) strongly agrees, followed by 39.29%(33), 55.95%(47), and 3.57%(3) strongly disagree that educational leaders care about the welfare of its faculty members. Motivational excursions and retreats are planned at least once a year, according to 86.90%(73) and 13.10%(11), respectively.

Table 7 demonstrates the views of teachers on how students' success in integrated science is driven by teacher motivation.

explanations from teachers	Frequency	Percent
Teachers provide their very best.	38	47.5
For effective instruction, teachers conduct research.	42	52.5
<b>Total</b>	<b>80</b>	<b>100.0</b>

Source: Field work, 2016

***The effect of teacher motivation and instructional methodologies on student outcomes in integrated science in the Upper East region, Ghana***

Of the 80 participants, 38% (47.5%) said that the enthusiasm of their teachers inspires them to put up their best effort. Once more, 52.5% (42) of respondents claimed that in order to teach well, teachers' motivation leads them to perform in-depth research. Both intrinsic and extrinsic rewards are anticipated for teachers' efforts. If their compensation, working conditions, and perks are improved, teachers will work more at their jobs.

Any educational system's success or failure is considerably more dependent on the teachers. Here's where inspiring teachers to do their best comes in. In order to ensure that kids are acquiring the necessary material, a well-motivated teacher must also have access to working incentives, favourable working conditions, and sufficient pay.

In order for the educational system to succeed, teachers must motivate pupils to fulfil the tasks that are assigned to them. By inspiring teachers and giving them the attention and priority they merit, learning will be improved. To meet basic needs is one of the key driving forces for employment in life. This illustrates how crucial teacher motivation is in any deliberate effort to raise learning results. Therefore, poor performance results when workers complain about the absence of fringe benefits such housing, transportation, and medical allowances; the long-term nonpayment of leave allowances; and the absence of recognition, merit awards, bonuses, and in-service training. If teachers' compensation, working circumstances, and perks are judged adequate, it is thought that they will put in more effort. In other words, they will appropriately prepare for their lectures, show up to class on time, attend school consistently, provide excellent instruction for the kids, and provide and grade assignments, tests, and exams.

What impact does teacher instructional strategies have on learners outcomes in integrated science?

The survey asked for their opinions on how teaching strategies by teachers affected how well their students performed in integrated science. Table 8 displays the survey's responses.

Table 8: Impact of Instructors' Instructional Techniques on Learners' Outcome

Statement	SA	AA	UC	DA	SD
i. <b>A research facility is available at the school for practical instruction.</b>	15	49	0	20	0
ii. <b>Teaching students lessons that would allow them to participate in investigative activities</b>	18	45	0	21	0
iii. <b>Giving students the chance to put their process skills to use.</b>	25	48	0	11	0
iv. <b>Giving students the chance to study jointly or in groups..</b>	31	53	0	0	0
v. <b>Building on the information and experiences that my students already have.</b>	38	46	0	0	0

*The effect of teacher motivation and instructional methodologies on student outcomes in integrated science in the Upper East region, Ghana*

vi. **Active learning must be encouraged in the classroom.** 23 61 0 0 0

Source: Field work, 2016 SA= Strongly Agree; AA = Agree; UC =Undecided; DA = Disagree; SD = Strongly

Disagree

The extent to which instructors' teaching practises influence students' achievement was looked at from the perspectives of the head teachers and integrated science teachers. A laboratory for practical courses is present at the school, according to 17.86% (15) of the 84 respondents, 58.33% (49) of them approve, and 23.81% (20). Again, the percentages of respondents who strongly agree, agree, or disagree with this assertion are 21.43% (18), 53.57% (45), and 25% (21) respectively. According to 29.76% (25) of those who strongly agree, 57.14% (48) of those who agree, and 13.10% (11) of those who don't, giving students opportunity to employ their process skills would improve their performance. The importance of giving pupils the chance to learn jointly or collaboratively is acknowledged by 63.10%(53) and 36.90%(31), respectively. The majority of respondents (54.76% of 46) and 45.24% of 38 strongly agree that I should draw on my pupils' prior knowledge and experiences. Similarly 72.62%(61) and 27.38%(23) firmly agree that encouraging active learning in the classroom is essential. There is rising evidence, according to Handelsman et al. (2004), that active learning techniques that involve students in the scientific discovery and process can improve learning and knowledge retention in instead of or in addition to lectures. In student-centered instruction (SCI), a teaching technique, the students direct the learning process. The student is the focal point of this learning model (learner). Students are given the chance to study individually and from one another, and the instructor coaches them in the abilities needed to do so successfully. Learners participate in role plays and simulations, lectures are replaced with self-paced and/or cooperative (team-based) learning, open-ended tasks and problems requiring critical or creative thinking are given, and lectures are substituted with these tactics. When SCI is used effectively, it can result in improved attitudes about the material being taught as well as improved motivation to learn, knowledge retention, and depth of comprehension.

Finally, it should be understood that learning itself serves as the best motivation for doing so. If a student can transition from extrinsic rewards (recognition, grades, etc.) to intrinsic rewards, the foundation for lifelong learning has been set. Table 9 indicates how integrated science teachers' instructional styles affect students' performance.

Table 9: Performance In academic and the Impact of Teacher Instructional Techniques

comments from teachers		Frequency	Percent
i.	It enhances the comprehension of the students	31	38.8
ii.	Teachers use efficient teaching techniques	49	61.2
<b>Total</b>		<b>80</b>	<b>100.0</b>

Source: Field work 2016



## ***The effect of teacher motivation and instructional methodologies on student outcomes in integrated science in the Upper East region, Ghana***

Of the 80 participants, 38.8% (31) said that using effective teaching techniques helped students learn more about scientific concepts, while 61.2% (49) believed that teachers provide useful lessons. An important factor in the study of sciences and biology is the method utilised to teach students. In order to enhance outcomes in Senior High Integrated Science, more efficient techniques must be discovered. Such strategies may include cooperative-based learning instructional techniques (activity-based) or learner-centered approaches to efficiently comprehend the subject matter and form a favourable attitude toward the subject. According to the National Report on the Development of Education in Kenya from the Ministry of Education, which was displayed at the International Conference on Education in September 2001, instructional goals should be more learner-centered to improve students' imaginative, critical, and creative abilities. Teachers serve as facilitators in a learner-centered classroom while students take the lead in discussions. So that students are allowed to express themselves and learn about the aesthetics of the teaching materials, teachers promote student conversation and only step in when necessary (Ahmad & Aziz, 2009; Eken, 2000). According to Froyd, a student's pedagogy has to promote critical thinking, collaborative learning, and connecting new knowledge to existing knowledge (2007). Learner-centered education is often referred to as interactive learning. Students participating in fieldwork activities and the use of media are two other forms of interactive teaching. Additionally, interactive professors encourage all students' participation and accommodate a variety of learning methods while assisting them in strengthening their particular areas of weakness (Curtin, 2005). Teachers also urge pupils to define concerns, have conversations, and ask questions (Chika, 2012). These methods also connect what students learn in the classroom to their everyday lives (Bush, 2006; Kumar, 2006).

### **RECOMMENDATION**

- In order to encourage teachers to put out their best efforts in integrating scientific instruction, the report urged senior high school decision-makers and the Ghana Education Service to keep offering classroom and material resources, along with incentives and remuneration.
- Senior high school authorities must provide TLMs to encourage activity-based teaching and learning techniques in integrated science sessions.
- To increase both integrated science educators' effectiveness as teachers and their pupils' academic success, senior high school heads must give them on-the-job training.

### **REFERENCES**

- Ahmad, F. & Aziz, J. (2009). Students' perceptions of the teachers' teaching of literature communicating and understanding through the eyes of the audience. *European Journal of Social Sciences*, Vol. 7, No. 3. Pp. 17-39.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Teachers College Press
- Bush, G. (2006). "Learning about learning: From theories to trends". *Teacher Librarian*, Vol. 34, No. 2, pp. 14-19.
- Chang, Y. (2010). *Students' perceptions of teaching styles and use of learning strategies*. Retrieved from [http://trace.tennessee.edu/utk\\_gradthes/782](http://trace.tennessee.edu/utk_gradthes/782)

***The effect of teacher motivation and instructional methodologies on student outcomes in integrated science in the Upper East region, Ghana***

- Chika, P. O. (2012). "The extent of students' responses in the classroom. *International Journal of Academic Research in Business and Social Sciences*, Vol. 2, No. 1, pp. 22-37.
- Collins, J. W., & O'Brien, N. P. (Eds.). (2003). *Greenwood dictionary of education*. Westport, CT: Greenwood.
- Cummins, J. (2007). Pedagogies for the poor? Realigning reading instruction for low-income students with scientifically based reading research. *Educational Researcher*, Vol. 36, No. 9, pp.564-573.
- Curtin, E. (2005). Instructional styles used by regular classroom teachers while teaching recently mainstreamed ESL students: Six urban middle school teachers in Texas share their experiences and perceptions". *Multicultural Education*, Vol. 12, No. 4, pp. 36-42.
- Eken, D. K. (2000). "Through the eyes of the learner: Learner observations of teaching and learning". *ELT Journal*, Vol. 53, No. 4, pp. 66-80. Educational Publishers.
- FAWE, (2004). Students' attitudes to the teaching of SMT subjects by girls in primary schools. The experience of the pilot phase. *FEMSA*. No. 11, pp.12.
- Fenech, M. (2006).The impact of regulatory environments on early childhood professional practice and job satisfaction: A review of conflicting discourses. *Australian Journal Early Childhood*, 31(2), 49-57.
- Froyd, J. E. (2007). *Evidence for the efficacy of student-active learning pedagogies*. Retrieved from <http://cte.tamu.edu/programs/flc.php> on 22/9/2012.
- Handelsman, J., Ebert-May, D., Beichner, R., Bruns, P., Chang, A. & DeHaan, R., (2004). Scientific teaching. *Science* 304(567), 521–522.
- Kang'ahi, M., Indoshi, F. C., Okwach, T. O. & Osodo, J. (2012). Teaching styles and learners' achievement in Kiswahili language in secondary schools. *International Journal of Academic Research in Progressive Education and Development*, Vol. 1, No. 3, pp. 62-82.
- Kumar, M. (2006). Constructivists epistemology in action. *Journal of Educational Thought*, Vol.40, No. 3, pp. 246-262.
- Lazear, E. P. (2003). 'Teacher incentives', *Swedish Economic Policy Review*, 10(2), 179-214.
- Ministry of Education (2001). *National report on the development of education in Kenya*. Presented at the International Conference on Education 46th session, Geneva, 5-7th September.
- Muraya, D. N. & Kimamo, G. (2011). Effects of cooperative learning approach on biology mean achievement scores of secondary school students' in Machakos District, Kenya". *Educational Research and Reviews*, Vol. 6, No. 12, pp. 726-745.
- Odundo, P. A. (2003). *Impact of instructional methods on learners' achievement in business studies in Kenya's secondary schools*. Unpublished PhD Thesis submitted to the University of Nairobi, November 2003. *Education*, 70, 256-284.
- Skaalvik, E. M., & Skaalvik, S. (2006). *Self-concept and self-efficacy in mathematics: relation with mathematics motivation and achievement*. Proceedings of the International Conference on Learning Sciences, Bloomington, Indiana.

***The effect of teacher motivation and instructional methodologies on student outcomes in integrated science in the Upper East region, Ghana***

- Tella, J., Indoshi, F. C. & Othuon, L. A. (2010). Relationship between students' perspectives on the secondary school English curriculum and their academic achievement in Kenya. *Journal of Educational Research, Vol. 1, No. 9*, pp. 382-389.
- Tremblay, S., Ross, N., & Berthelot, J. (2001). Factors affecting grade 3 student performance in Ontario: A multilevel analysis. *Education Quarterly Review, 7 (4)*, 1–12. Retrieved from <http://www.geog.mcgill.ca/faculty/grade3ontario>.
- UNESCO. (2006). *EFA Global monitoring report 2006: Literacy for Life*: Paris, UNESCO.
- Vansteenkiste, M., Zhou, M., Lens, W., & Soenens, B., (2005). Experiences of autonomy and control among Chinese learners: Vitalizing or immobilizing? *Journal of Educational Psychology, 97(3)*, 468–483.
- Zeeb, M. S., (2004). *Improving student success through matching learning and teaching styles*. Retrieved from <http://www.creativelearningcentre.com>