

**INTERNATIONAL JOURNAL OF
INNOVATIVE RESEARCH AND KNOWLEDGE**

ISSN-2213-1356

www.ijirk.com

Teacher Professional Commitment as a Determinant of Transfer of Strengthening of Mathematics and Science in Secondary Education (SMASSE) Pedagogical Skills in Kenya

Omare Elijah, Dr. Rosemary Khitiei Imonje & Professor Grace Nyagah
Department of Educational Administration and Planning, School of Education,
University of Nairobi, Nairobi, Kenya

ABSTRACT

The purpose of this study was to investigate teacher professional commitment as a determinant of transfer of Strengthening of Mathematics and Science in Secondary Education (SMASSE) pedagogical skills in secondary schools in Kenya. The research was delimited to Kisii County and adopted ex post facto design. A sample made of 229 science teachers, 88 principals and 752 form four students was used. Data was collected by use of questionnaires and lesson observation. Students', teachers' and principals' responses indicated that science teachers had high level commitment; however, lesson observation revealed weak teacher commitment towards utilization of ASEI-PDSI pedagogy. Similarly, hypothesis testing established a statistically insignificant relationship between teacher commitment and transfer of pedagogical skills, implying that teacher professional commitment did not inform use of this pedagogy in Kenya. It was then concluded that extraneous variables majorly students' entry behaviour could have constrained teacher professional commitment from shaping transfer of SMASSE pedagogical skills. It was recommended that the Ministry of Education should enhance closer supervision and monitoring of form one selection and admission by schools to ensure that this is done in conformity with the existing cut-off point as per Government policy. Furthermore, CEMASTE and schools need to involve science teachers when doing curriculum innovation for SMASSE programme to create the much sought for ownership.

Key words: *Sciences, Pedagogy, Professional commitment, transfer of skills, performance*

Introduction

Butucha (2012) conceptualises Teachers' professional commitment as the willingness of tutors to "go the extra mile" to guarantee students' fruitful learning. Professionally committed teachers help learners during standby time, liaise with and are enthusiastic to work with parents and exploit available class time gainfully. According to research, professional commitment is an attitude that someone has towards one's job. Teacher commitment helps to distinguish those who are zealous to their career and those who are not. Janelle (undated) for example argues that committed teachers are 21st century learners; they expense their time to life-long learning. She further maintains that just like physicians never stop learning new skills to help save lives, teachers who are steadfast to their job never stop acquiring new approaches to use to involve and teach their students; such tutors understand that teaching is a career that changes standards and regulations quite regularly and are committed to keeping up with these over changing pedagogies.

Studies in developed countries (Cochran and Reese, 2007; Vok, 2003; McKinney and Fink, 2005 and McDevitt, 2008 all quoted by Butucha, 2012 indicate that many teachers exit their profession within the first 5 years and this trend continues until only 10% remain up to retirement age, an evidence of low commitment to the teaching profession. Literature reviewed shows that a similar trend prevails in developing countries: teachers in Ethiopia and Nigeria have shown low commitment towards curriculum innovations because they are not integrated in its development and how best to implement such reforms (Oloruntebe (2011) and Butucha (2013). Oloruntebe (2011) further notes that most curricular innovations in Africa and a few other parts of the world were initiated "top-down" through "power coercive" or unilateral administrative decisions" in utter negligence of the much powerfully-embraced "grassroots". Indeed, teachers are the implementers hence their response to all these innovations is what will inform effectiveness of their use.

Immense resources in terms of time, human effort and finance have been invested by the Government of Kenya in capacity development of science teachers since the year 1998 to date. The fundamental objective of this undertaking has been to endow the tutors with a modern pedagogical innovation to help realise quality science curriculum implementation. This 21st century instructional method stresses on Activity focused, Students' centred Experiments through Improvisation using Plan to See and Improve approach –herein referred to as ASEI-PDSI or Strengthening of Mathematics and Science in Secondary Education (SMASSE) pedagogical skills. Table 1.1 shows an analysis of students' examination performance in Kenya Certificate of Secondary Examination (KCSE) before and after SMASSE's commissioning in the year 2004.

Table 1.1: National subject percentage Mean score since the year 2003

YEAR	MATHS	PHYSICS	CHEMISTRY	BIOLOGY
2003	18.90	24.01	26.73	32.00
2006	18.60	23.94	26.01	31.39
2009	19.73	41.32	25.39	41.95
2011	21.13	31.31	19.14	27.14
2013	24.80	36.70	23.81	32.50
2016	24.86	30.11	22.07	25.24
2017	23.91	29.46	22.13	21.31

Source: The Kenya National Examinations Council

Table 1.1 shows a representative sample of students' KCSE performance since the advent of SMASSE INSET in the year 2003 to date. As is evident from the data, national KCSE mean score before SMASSE (up to the year 2003) and after SMASSE launch (since the year 2004 until now) in Kenya is similar; albeit with small variations. Equally, the mean scores of Kisii County since her creation (in the year 2010 when the current constitution was promulgated paving way to the creation of 47 counties in Kenya) are comparably the same as the national rating (as shown in Table 1.2). In both scenarios (National and County performance), poor percentage scores of between 41.95 and 15.95 are registered. The performance situation even worsened for the last two year (2016 and 2017). This was attributed to the Ministry of Education's swift move to effectively implement strict adherence to the regulations governing conduct of national examinations in Kenya.

Table 1.2: Kisii County K.C.S.E Percentage mean score since 2010

YEAR	MATHS	PHYSICS	CHEMISTRY	BIOLOGY
2010	25.19	28.27	30.01	35.65
2011	24.00	29.13	29.30	34.40
2012	25.08	28.43	29.70	34.91
2013	25.76	30.79	28.18	36.12
2014	26.90	31.09	29.60	37.86
2015	26.09	31.00	30.32	37.34
2016	20.01	24.03	23.57	24.67
2017	20.00	25.41	22.98	22.75

Source: The Kenya National Examinations Council

The similarity between Kisii County KSCSE scores and the national one is among the reasons which vindicated the delimitation of the study to Kisii County since the research findings could be generalized to apply to all counties in Kenya. The second justification of this research was motivated by the outcry of education stakeholders in the area concerning the level of professionalism of the teachers involved (Nyagesiba, 2015). The Ministry of Education officials and parents in Kisii County had persistently accused tutors of professional negligence and misconduct which took the form of absenteeism. The absence of the teachers from duty was said to be contributed by drunkenness, engaging in business and participation in burial ceremonies. All the aforementioned considerations put science teachers' commitment into disrepute. It is also worthy to note that from available research and literature, the current research topic had not been studied in Kenya. This thrust the need for this study.

Statement of the Problem

Centre for Mathematics Science and Technology Education in Africa (CEMASTEIA) has vigorously discharged capacity development for secondary science teachers in Kenya through SMASSE training since the year 2004 to date. The fundamental objective of this undertaking has been to equip the tutors with ASEI-PDSI pedagogical skills to use to improve the hitherto poor performance in the sciences in Kenya Certificate of Secondary Education (KCSE). However, Science performance by percentage before and after the advent of the training has remained appalling (between 41 and 16) as shown by Table 1.1. Many studies done touching on level of implementation of ASEI-PDSI pedagogy across Kenya reveal poor response by science teachers towards its use. The essence of this research therefore was to answer the key question of the impact of teacher professional commitment on utilization of ASEI-PDSI pedagogy in Kenya.

Research Hypothesis

H₀ There is no significant relationship between science teachers' commitment in terms of planning, teaching and assessment and transfer of SMASSE pedagogical skills in Kenya.

Significance of the Study

The findings of the study were anticipated to have both theoretical and practical implication for the future use of SMASSE pedagogy in curriculum implementation in Kenya and the rest of Africa where this professional development initiative was underway. In theory, the research was expected to contribute to the advancement of knowledge on the role teacher professional commitment in informing effectiveness of use of ASEI-PDSI by science teacher in Kenya. In a practical sense, the study was to provide school managers, more so principals, with understanding of how teacher professional commitment could be developed and nurtured within the science teachers so as to ensure sustained engagement of ASEI-PDSI pedagogy in their instruction.

Limitations of the Study

Examination malpractices were given as a first possible limitation of the study as it was identified as a threat to internal validity to the dependent variable (Kenya Certificate of Secondary Examination-KCSE performance). A number of limitations cropped up during data collection which the author considered proper to bring to light at this juncture: First, Some schools were located in remote and inaccessible parts of Kisii County. This prompted the author to substitute the schools with those that were more reachable. Secondly, the issue of cooperation by respondents became a challenge in some schools prompting picking of other schools for replacement. Lastly, the number of follow ups turned out to be more than envisaged. This eventuality escalated the cost of fieldwork.

Delimitations of the Study

As at the time of the study Kisii County had 9 sub-counties, 319 public secondary schools and 1420 science (biology and chemistry) teachers. Only biology and chemistry teachers participated in the study leaving out those of physics and mathematics. Further, the study used school mean percentage scores as the dependent variable and not individual student's percentage scores.

Assumptions of the Study

It was assumed in the study that: CEMASTEVA conducted high quality training for science teachers; Effective use of ASEI-PDSI pedagogy would automatically translate to improvement in performance in biology and chemistry and that respondents gave honest and accurate data.

Literature Review

Bennis (1968) views "Commitment" as a powerful word. According to him, the term evokes many images such as prison, a factory and a church. What do they have in common? Kadyschuk (1997) called them distinct, alternate form of commitment. Whether by physical coercion, material remuneration or symbolic norms, commitment is drawn from all people as they move into the main stream of social life. One of the major sectors of society that incorporates "the ranks of the committed is the work place." The present study examined teacher commitment as a professional characteristic as regards its impact on transfer of SMASSE pedagogical skills. Commitment refers to the extent to which a teacher identifies with the teaching profession, accepts and practices its values.

In the words of Croswell (2006), teacher commitment is one of the key elements in education and is arguably becoming an increasingly important factor in the teaching profession. The work teachers engage in on daily basis

is complex and demanding and requires a level of personal engagement and commitment. Due to mounting demands and new challenges inherent in the current educational climate, what it means to be a committed teacher is also changing. It has become imperative to gain further insight into teacher commitment due to its close association with concepts such as quality of teaching, teacher adaptability, teacher attendance, teacher burnout, and teacher retention, organizational “health” of the school and students and learning outcomes.

While academic qualification, subject matter knowledge, pedagogy and teaching skills are important factors in determining teacher’s competency and teaching efficacy, a knowledgeable teacher without motivation and dedication to teaching may not sustain quality education (Manning and Patterson, 2005). In other words, the quality of teaching is not only governed by the knowledge and skill competence of teachers but also their enthusiasm and commitment in teaching (Rikard, 1999). Kwok-Wair (2006) contends that teachers who are dedicated to teaching might facilitate school-based innovations (like use of ASEI-PDSI pedagogy) that are meant to benefit students’ learning and development. In fact, according to Huberman (1993), commitment and engagement have been identified as one of the most critical factors in the success of education.

Many researches have been carried out in both developed and developing countries to find out what motivates students in teacher education institutions to choose teaching as a career. In general, the studies have shown that such students go for teaching as a career for various intrinsic, extrinsic and altruistic motivates (Eliech, 2006). The assumptions in most of the studies seem to be that students in teacher education institutions will enter the teaching profession after completing their course of study.

Evidence from some studies for instance that of Oyenike, Oni and Oladipo, (2013) and Achimugu (2005) however shows that not all such students intend to teach after graduation. The studies noted a group of education graduates referred to as the “uncommitted” – those who decided not taking teaching as a job immediately after they are graduated and who regard teaching as irrelevant to their future goals. In Nigerian situation (Igbo, 2011) the uncommitted group are quite large. Moreover, studies have shown that many of those who join the profession after graduation leave early because such people had a career plan other than teaching. These invariably have an overall negative effect not only on the quantity but also on the quality of teachers produced for schools.

While studying affective and cognitive characteristics of Nigerian student-teachers, Oyonike et al. (2013) used a sample of 630 teacher trainees covering Nigerian university undergraduates. It also involved a survey of both in-service of primary and secondary school tutors. Teacher trainees were drawn from among the final year students of each institution. This choice was prompted by the realization that they had been adequately exposed to both content and pedagogic courses in the process of their training as well as acquaintance with practical orientations in terms of teaching practice. The study discovered that the main motive for entering into teaching course by these students was due to their inability to meet the admission requirement in their course of choice. This served to partially explain why most of these teachers (67%) were found to exhibit low commitment towards the teaching profession.

The level of implementation of ASEI-PDSI instructional approach by science teachers in Kenya may be used to predict on their commitment to this pedagogy. Ndirangu, Nyagah and Kimani (2017) have ventured into this topic in a study done in Kenya. All the research instruments used (questionnaires, interviews and lesson observations) established that use of student –centred teaching strategies were being applied only partially. This work adds to those that have revealed that teacher commitment towards use of ASEI-PDSI was questionable.

Research by Ochanya (2013) in Nyamaiya sub-county of Nyamira county aimed to determine level of implementation of ASEI-PDSI approach in science curriculum implementation. After data analysis, employment

of this modern pedagogy was given a score of 2.0 out of a maximum of 5.0. It was then concluded that ASEI-PDSI approach was inadequately used in the secondary schools involved. This finding implies that the teachers' commitment to use of this pedagogy was weak. This outcome also agrees with Sifuna and Kaine (2007) where it was determined that while science tutors perceived teacher training by SMASSE had done well in exposing them to practical teaching, their classroom practices depicted a contrary picture: most if not all the teaching was teacher-centred because utilization of ASEI-PDSI was largely ignored. While noting that it was evident from presented findings that successful application of ASEI-PDSI principles depended on the extent of teacher preparedness, the research established that teachers' commitment towards use of this SMASSE pedagogy was quite low as it was confirmed from lesson observations. At the same time, the science teachers argued that their commitment was below par because this pedagogy was a drain to the time set aside for syllabus coverage. Kabutu, Kariuki, Ndirangu and Okao (2014) investigated secondary school teachers' perceptions of factors that influence their morale and commitment at work in Nakuru County, Kenya. The result of this investigation established that motivation variables determined teacher commitment.

Methodology

Ex post facto research design was employed. This research targeted 319 public secondary schools, 319 principals, 1412 science teachers and 20125 form four students in Kisii County. Students were included in the study so as to triangulate on some of the data and minimize on the bias associated with self-report by teachers. The sample size comprised 121 chemistry teachers, 108 biology teachers, 88 principals and 752 form four students. Questionnaires (for science teachers, principals and form four students) and observation checklist were the data collection instruments used. Test-retest method was used to establish reliability of data collection instruments. A reliability coefficient of 0.76, 0.79 and 0.83 was obtained for students' questionnaires, teachers' questionnaires and principals' questionnaires respectively. This reliability, as asserted by Kothari (2004) was considered high enough for use in the study.

Findings of the Study

The main objective of the study was to establish the relationship between teachers' commitment and transfer of SMASSE pedagogical skills. Teachers' commitment was assessed by requesting science teachers to rate the level of their commitment in terms of planning, teaching and assessment on a scale of 1 to 5 (1-strongly disagree, 2-disagree, 3-undecided, 4-agree and 5-strongly agree). Principals and students were also provided with statements that assessed their perceptions on teachers' level of commitment. The mean scores obtained in biology and chemistry in KCSE 2016 were used to represent the transfer of pedagogical skills. The students mean scores were transformed into z-score and then t-scores. Findings on objective five are presented in the subsequent sub-sections.

Students' Perception on Teachers Commitment

Student participants were provided with 9 statements that assessed their perception on their teachers' level of commitment. The statements were assessed on a scale of 1 to 5 (1-strongly disagree, 2-disagree, 3-undecided, 4-agree and 5-strongly agree). The sum of scores obtained by the informants in the overall scale was employed to establish the respondents' level of perception on teachers' commitment. Given that the sum of items on the scale was 9, the lowest achievable score for an individual in the scale was 9 (1x9) and the highest probable score was 45 (9x5). The scores were then grouped into 3 levels where scores ranging from 9 to 22 represented low level of commitment, scores ranging from 23 to 31 represented moderate level of commitment and scores ranging from 32 to 45 represented high level of commitment. Summary of the findings are presented in Tables 1.3 and 1.4.

Table 1.3: Students' Perception on Teachers' Level of Commitment

Level of commitment	Frequency	Percent
Low level of commitment	21	3.2
Moderate level of commitment	92	14.0
High level of commitment	542	82.7
Total	655	100.0

As revealed in Table 1.3, majority (82.7%) of students showed that their teachers had a high level of commitment, 9.4% indicated that they had a moderate level, while only 3.2% felt that they had a low level of commitment.

Table 1.4 represents the summary of the descriptive analysis of students' perception on teachers' level of commitment.

Table 1.4: Mean and standard deviation of Students' Perception of Teachers' Level of Commitment

	N	Minimum	Maximum	Mean	Std. Deviation
Commitment	655	9	45	37.43	6.329

From Table 1.4, findings expose that the lowest score attained in level of commitment was 9, while the highest score was 45. The mean score was 37.43 (SD=6.329), which indicates that the average level of teachers' commitment according to students was high. This finding is supported by Donahue (2004) whose study opined that students felt that their teachers were committed to discharging their mandate. In particular, students' perception of their teachers' instructional behaviours were found to be very positive. When this author requested the learners to state what they did not like about their tutors one student wrote in the questionnaire:

"I sincerely do not like my teacher because he comes for lessons late, does not mark assignments issued, asks one of us to write notes on the blackboard for others to copy and skips some topics. He is also not patient with our queries on subject topics not well understood."

All these observations by the student are attributes of a teacher whose professional commitment is low.

Principals' Perception on Teachers' Commitment

Principals were provided with 12 statements that assessed their perception on teachers' level of commitment. The statements were assessed on a scale of 1 to 5 (1-nil, 2-low, 3-medium, 4-high and 5-very high). The sum of scores obtained by the respondents in the overall scale was used to establish the informants' level of perception on teachers' commitment. Since the sum of items on the scale was 12, the lowest achievable score for an individual in the scale was 12 (1x12) and the highest attainable score was 60 (12x5). The above figures were then placed into 3 levels where scores ranging from 12 to 30 represented low level of commitment, scores ranging from 31 to 42 stood for moderate level of commitment and scores ranging from 43 to 60 represented high level of commitment. Summary of the results are presented in Tables 1.5 and 1.6.

Table 1.5: Principals' Perception on Teachers' Level of Commitment

Level of Commitment	Frequency	Percent
Low level of commitment	3	4.4
Moderate level of commitment	12	17.6
High level of commitment	53	77.9
Total	68	100.0

As is evident in Table 1.5, majority (77.9%) of principals felt that teachers had a high level of commitment, 17.6% indicated that they had a moderate level, while 4.4% showed that they had a low level of commitment. This finding disagrees with SMASSE INSET (2010) where principals had reported that majority (56%) of the science tutors showed low commitment to use of ASEI-PDSI teaching method. Understandably, the observed variance might have been triggered by improvement in teacher commitment over the specified period of time. Table 1.6 denotes the summary of the descriptive analysis of principals' perception on teachers' level of commitment.

Table 1.6: Descriptive analysis of Principals' Perception of Teachers' Level of Commitment

	N	Minimum	Maximum	Mean	Std. Deviation
Commitment	68	28	60	48.16	7.467

From Table 1.6, findings determined that the lowest score attained in level of commitment was 28, while the highest score was 60. The mean score was 48.16 (SD=7.467), which implies that the average level of teachers' commitment according to principals was high. According to CEMASTE A (2011) school principals also rated teachers' commitment as very high, consequently concurring with the present study. However, this research, through lesson observations noted that the situation on the ground was to the contrary because most teachers observed recorded low teacher commitment towards the ASEI-PDSI pedagogy.

Teachers' Perception on their Level of Commitment

Science teachers were provided with 10 statements that assessed their perception on their level of commitment. The statements were assessed on a scale of 1 to 5 (1-strongly disagree, 2-disagree, 3-undecided, 4-agree and 5-strongly agree). The sum of the scores reached by the informants in the overall scale was used to establish respondents' level of their perception on their commitment. Given that the sum of items on the scale was 10, the least applicable score for an individual in the scale was 10 (1x10) and the highest attainable score was 50 (10x5). The scores were then grouped into 3 levels where scores ranging from 10 to 25 stood for low level of commitment, scores ranging from 26 to 34 represented moderate level of commitment and scores ranging from 35 to 50 meant high level of commitment. Summary of the results are placed in Tables 1.7 and 1.8.

Table 1.7: Teachers' Perception on their Level of Commitment

Level of commitment	Frequency	Percent
Low level of commitment	1	0.8
Moderate level of commitment	8	6.4
High level of commitment	116	92.8
Total	125	100.0

As demonstrated in Table 1.7, majority (92.8%) of teachers indicated that they had high levels of commitment, 6.5% had moderate levels, while 0.8% had low levels of commitment. As already pointed out, data emanating from lesson observation gave a contrary verdict: low level of commitment was evidently and conspicuously in existence. The rationale for the preceding scenario is explained by Hoskin (2012) who argues that this is due to response bias (more specifically social desirability bias) which is invariably inherent in self-report data.

Table 1.8: Mean and standard deviation of teachers' perception of their level of commitment

	N	Minimum	Maximum	Mean	Std. Deviation
Commitment	125	17	45	39.24	4.207

The findings in Table 1.8 show that the lowest score attained in level of commitment was 17, while the highest score was 45. The means score was 39.24 (SD=4.207), which indicates that on average level of teachers' commitment was high. A research by Rizvi and Elliot (2005) carried out in Karachi, Pakistan also established that teachers perceived themselves as being truly professional- a finding that is held counter to the often-possessed belief by teachers themselves that teaching is not a profession.

Hypothesis Testing

To determine the relationship between science teachers' commitment and transfer of SMASSE pedagogical skills, the following null hypothesis was tested:

H₀ There is no significant relationship between science teachers' commitment in terms of planning, teaching and assessment and transfer of SMASSE pedagogical skills.

To test this hypothesis, a bivariate correlation analysis was conducted using Pearson product Moment Correlation Coefficient. Pearson correlation was settled for since the two variables are measured in the interval scale. Table 1.9 shows the result of the Pearson Correlation between teachers' commitment and transfer of SMASSE pedagogical skills.

Table 1.9: Correlation between teachers' commitment and Transfer of SMASSE Pedagogical Skills

		Transfer of SMASSE Pedagogical Skills
Commitment	Pearson Correlation	.108
	Sig. (2-tailed)	.229
	N	125

Results in Table 1.9 exhibit that there was a weak positive relationship between teachers' commitment and Transfer of SMASSE Pedagogical Skills, $r(125) = 0.108$, $p=.229$, a relationship that was not statistically significant, $p>0.05$. From this outcome, the null hypothesis was thus not rejected. Perceptions of teachers' commitment by students, principals and teachers themselves showed a high rating; however, hypothesis testing gave a conflicting opinion: there was no statistically significant relationship between teachers' commitment and transfer of ASEI-PDSI pedagogy. This observation is supported by Oloruntegbe (2011) who found out that teachers were yet to readily embrace modern pedagogies; they often showed resistance and lacked commitment to implementation of curriculum reforms because they were seldom involved in the development and even how best

to implement them. For this reason, teachers frowned at any attempt to have them utilize modern teaching methods like ASEI-PDSI pedagogy.

Conclusion

Based on the findings, the null hypothesis which related teacher professional commitment with ASEI-PDSI pedagogy was not rejected; accordingly therefore, it was concluded that teacher professional commitment does not influence transfer of ASEI-PDSI; however, extraneous variables like students' characteristics, lack of motivation and poor mastery of ASEI-PDSI pedagogical skills could intervene. In view of the foregoing inference, it was recommended that those in-charge of teacher management (the Teachers Service Commission and schools' Board of Management) need to interrogate this scenario of science teachers' weak commitment towards the innovative ASEI-PDSI pedagogy. As a consequence, the same education actors and CEMASTEAs should then consider involving teachers when doing curriculum innovation of SMASSE programme so as to accord them an opportunity to have their input accommodated hence create ownership by the tutors.

REFERENCES

- Bennis, W. (1968). *The temporary society*. New York, Harper & Row.
- Butucha, K. G (2013). Teachers perceived commitment as measured by age, gender and such type. *Greener Journal of Education Research* 3 (8), 363-372.
- Kwoki-wai, C. (2006). In-service teachers' motives and commitment in teaching. *Hong Kong Teachers' centre Journal*, vol.5.
- Caprara, G., & Barbaranelli, C. S. (2006). Teachers' efficacy beliefs as determinants of job satisfaction and students' academic achievement: A study at the school level. *Journal of school psychology*, (44), 473-49
- Carlsen, K. (1997). The effect of teacher certification and task level on mathematics achievement. *Journal of Teaching and Teacher Education*. vol. 13 , No.4.
- Carmeli, A. (2007). The influence of leaders' and other referents normotive expectations on individual involvement in creative work. *The Leadership Quarterly Journal* 18., 35-48
- CEMASTEAs (2010). *Popularising Student-centred learning in Kenya: Looking Without to Improve Within*. CEMASTEAs.
- CEMASTEAs, (2012). *Secondary School Situational Analysis: A Paper Presented at Principals and Deputy Principals workshop on Supervision of ASEI-PDSI at School Level in Kenya*.
- CEMASTEAs (2008). *Handbook on management of district SMASSE programmes*. Nairobi: SMASSE-JCA
- EMASTEAs (2011). *A situational analysis on implementation of SMASSE project in Kenya*, CEMASTEAs: Nairobi

- CEMASTEA (2011). Lesson observation study: The practice of ASEI-PDSI: Research development department, CEMASTE, Nairobi.
- CEMASTEA (2016). *Secondary school principals' workshop report*. Ministry of Education, Nairobi.
- Creswell, J (2008). *Educational Research; Planning, conducting and evaluating quantitative and qualitative research*. New Jersey: Pearson: Morrill Prentice Hall.
- Cochran, K. D. (1993). Pedagogical content knowledge: An intergration model for teacher preparation. *Journal of teacher Education*, 4(1), 16-29.
- Cochran, L. & Reese, S. (2007). Preparing the new teacher techniques: *Connecting Education and Careers* 82(6).
- Coladarci, T. (1992). Teachers' sense of efficacy and commitment to teaching. *Journal of Experimental Education* 60 (4)., 322-337.
- Crosswell, L. (2006). Understanding teacher commitment in times of change. unpublsh Ph.D thesis submitted to Queensland University of Technology.
- Egbo, B.(2011). Teacher capacity building and effective teaching and : aseamless connection. *Mediterranean Journal of Social Sciences* vol.
- Guskey, R. T. (2002). Professional development and teacher change. *Journal of Teachers and Teaching:theory and practice*, Vol.8, No.3/4.
- Guzdial, M. & Ni, L. (2007). *What makes Teachers Change? Factors that Influence post – Secondary Teachers Adoption Of New Computing Curricular*. Technical Report GT-IC-08-02.Washington: MITRE
- Huberman, M. (1993). *The lives of teachers*. London; Cassel Villiers House.
- Janelle, C. (undated). Professional commitment in the teaching proffesion. Down loaded on 10th.Nov. 2018 from www.teachhub.com/proffesional-commitment-teaching-profession.
- Kabutu, A.W., Kariuki, M. Ndirangu, A. K., Okao, M.E. (2014). Secondary school teachers' perceptions of the factors that influence their morale and commitment to work. A case of Nakuru District. *International journal of innovation and applied studies* 9(4), 1589 -1597.
- Kadyschuk, R. (1997). Teacher commitment: A study of the organisational commitment, professional commitment and union commitment of teachers in public secondary schools in Saskatchewan. *Unpublished Doctor of pholosophy thesis in the University of Saskatchewan*. Canada.
- Makewa, L.N. (2011). Teachers' attitude toward SMASSE in Nandi Central District, Kenya. *International Journal of Education and SocialSciences* Vol. 1 No. 14.
- Manning, M. & Patterson, J. (2005). Unfulfilled promise: ensuring quality teachers for our Nation's schools. *Journal of childhood Education*, 81 (4), 249-250.
- Mc Devitt, R. (2008). Teac hing crusade helps teachers and students succeed. Retrieved Nov.10th. 2018 from <http://www.prlog.org/10121346-teaching-crusade-helps-teachers-and-students-succeed.pdf>.
- Mugenda, A.G. & Mugenda, O. M. (2008). *Social Science Research; Theory and Principles*. Nairobi: Applied Research and Training Purpose publishers.

- Ndirangu, C. W. (2013). *Factors influencing teachers' level of implementation of SMASSE innovation in Nyeri County, Kenya*. Unpublished PhD Thesis, University of Nairobi.
- Nyagesiba, G. (2015). Stakeholders' concern over education quality in Kisii County. *The Star Newspaper, Nairobi Science and Education* 2(2).
- Oladipo, A. & Oyonike, A. (2009). Teacher training quality and effectiveness in the context of basic education: An Examination of Primary Education Studies in Nigeria. *Journal of International Cooperation in Education, Vol 10, No. 1 pp 107 – 125*
- Oloruntegbe, K. O. (2011). Teachers' involvement, commitment and innovativeness in curriculum development and implementation. *Journal of emerging trends in educational research and policy studies*. 2(6)
- Orodho, J.A. (2005). *Elements of Education and Social Science Research methods*. Nairobi: Masola Publisher.
- Rizvim, M & Elliot, B. (2005). Teachers' perceptions of their professionalism in Government primary schools in Karachi, Pakistan. *Journal of Asian-Pacific teacher education* 33(1)
- SMASSE INSET, (2010). *Secondary school situational analysis: A Paper presented at principals and deputy principals workshop on supervision of ASEI-PDSI at school level in Kenya*.
- SMASSE (2014). CEMASTE A strategic plan (2014-2019). ICADETA, Nairobi
- SMASSE Project, (2007). *Report on survey of Impact of SMASSE INSET in Kenya* . CEMASTE A, Nairobi.
- SMASSE project (2010). Report on 2nd workshop on effective operation of SMASSE project held at KSTC on 22nd and 23rd May 2000
- SMASSE(2009). The ASEI movement; Available online <http://www.smasse.org>
- SMASSE, (1999). The baseline studies, Nairobi, SMASSE. Unpublished.
- SMASSE, (2002). Effective operation and management of SMASSE project. CEMASTE A, Nairobi.
- Vok, H. (2003). Responding to teacher shortage, In: Butucha, K. G. (2012). Teachers' perceived commitment as measured by age, gender and school type, 3(8).