Original Paper

Contribution of Intrinsic and Extrinsic Factors to Teacher Motivation

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Abstract

Teachers feel their work is becoming increasingly stressful and their status is falling leading to less job satisfaction with a concomitant loss in motivation. This study sought to find out in quantitative terms, the amount of motivation that the intrinsic and extrinsic socio-economic factors make to teacher motivation. The research design employed for this research is quasi-experimental. Two thousand and ninety-eight (2,098) teachers were selected from the Upper East Region of Ghana. Both quantitative and qualitative data was collected. The results showed that intrinsic and extrinsic socio-economic factors do motivate teachers in the execution of their work. However, not a strong association exist between teacher motivation and the intrinsic and extrinsic socio-economic variables. Not much of teacher motivation depends on socio-economic factors. Per the findings of the study, the association between the degree of motivation that teachers receive from the intrinsic and extrinsic socio-economic factors, M_ϵ, and the percentage of respondents that claim they are motivated by the factors, f_ϵ, could be represented by the polynomial relation, $M_\epsilon = \mu_3(f_\epsilon)^3 - \mu_2(f_\epsilon)^2 + \mu_1(f_\epsilon) - \mu_0$. Intrinsic and extrinsic (socio-economic) factors cannot sustain the motivation of teachers permanently, even though the lack of them will lead to demotivation of teachers.

Keywords

teachers, motivation, socio-economic, intrinsic, extrinsic, factors, schools

1. Introduction

The uniqueness of teacher motivation lies in the fact that instrumental or extrinsic process motivation does not really give teachers satisfaction and does not really motivate teachers. Intrinsic process motivation can be defined as the enthusiasm to work, because working gives the prospect for self-realization. Intrinsic process motivation augments the desire:

1) to go in search for something new;

2) to experiment with pioneering schemes of work;

3) to go in search of prospects for professional development.

That is how one can attain self-realization at the place of work (Leonard, Beauvais, & Scholl, 1999). Lapeniene and Dumciene (2013) in their study, concluded that for teachers, subjective creativity corresponds in a positive manner with intrinsic process motivation. Teachers' subjective creativity can be predicted by the level of the teachers' intrinsic process motivation.

Intrinsic process motivation is dissimilar to instrumental or extrinsic motivation. Extrinsic motivation is the enthusiasm to work because of reward (tangible or intangible). According to Amabele (1996) a negative correlation between creativity and instrumental motivation could be established. Working creatively requires different qualities in comparison with working effectively or productively. Instrumentally motivated teachers are reluctant to experiment with unconventional procedures of work and save time which is inevitable for innovation at workplace.

In part, teacher motivation is affected by economic factors, as teachers make rational economic decisions about their careers and seek better paid work where they can. However, there is also considerable evidence that teachers feel their work is becoming increasingly stressful and that their status is falling (Macdonald, 1999) leading to less job satisfaction with a concomitant loss in motivation. There was evidence, for example, that teaching conditions had deteriorated drastically in Senegal, Burkina Faso, and Mali, with an insufficient supply of student textbooks and teaching materials, inadequate equipment, poor teaching and living accommodation, and a high number of students per classroom (Caillods, 2001).

This study sought to find out in quantitative terms, the amount of motivation that the intrinsic and extrinsic factors make to teacher motivation. Just like any social construct, it is difficult to put figures to teacher motivation either by calculation or by measurement using an instrument. Vroom (1964) in his Expectancy Theory of Motivation proposed that motivation could be determined by the following equation:

Motivation, $M =$ Perceived probability of success (Expectancy, E) $\times$ Connection of success and

Reward (Instrumentality, I) $\times$ Value of obtaining goal (Valence, value, V)

That is,

$$M = E \times I \times V.$$

No figures were arrogated, however, to the amount of motivation.

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2. Methodology

Rather than entering into debates about what constitutes scientifically based research, the very pressing question that ought to be asked is: 'What kinds of research can produce well warranted knowledge that can help improve practice and policy?' The research that produces such knowledge can take many forms, from descriptive research to interpretive research to hypothesis-testing research. It can rest on a variety of philosophical positions and can use diverse strategies for gathering evidence and producing conclusions, from case studies to experiments to critical ethnographies to surveys to action research.

The research design employed for this research is ex-post facto. The research type is descriptive. Both quantitative and qualitative data was collected. Nominal data was collected, but converted into ratio data by computing the percentages of respondents who gave a particular response. Other ratio data like the level or degree of motivation in percentage terms that teachers derived from a particular factor or determinant were also collected using the same instrument.

2.1 Population

The population for the study comprised all teachers in Primary Schools, Junior High Schools and Senior High Schools (teachers) in the Upper East Region (UER) of Ghana on the other (Table 1).

Table 1. Population of Teachers in Public pre-Tertiary Institutions in UER ((GSS, 2018)

Institution	Number of Institutions	Number of Teachers
PRIMARY (P)	740	6,164
Junior High School (JHS)	498	4,601
Senior High School (SHS)	30	1,067
TOTAL	1,268	11,832

2.2 Sampling and Sample Size

The sample consists of:

1) teachers of Primary Schools (PS),

2) teachers in the Junior High Schools (JHS), and

3) teachers in the Senior High Schools (SHS) selected from the Upper East Region of Ghana.

The teachers were sampled by census from the selected schools. That is, every teacher in the selected schools was included in the study. Two thousand and ninety-eight (2,098) teachers were selected from a total of eleven thousand eight hundred and thirty-two (11,832) teachers. The sample size was determined with the aid of a table of sample sizes (The Research Advisors, 2006), at a confidence level of 99% and an error margin of 2.5%.

The sample size is illustrated on Table 2 and Table 3. A total of two thousand and ninety-eight (2,098) teachers were sampled from 226 pre-tertiary schools.

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Table 2. ample Size for Study

Institution	Number of Institutions	Number of Teachers
PRIMARY	100	780
JHS	100	756
SHS/TI	33	562
TOTAL	233	2,098

Two hundred and thirty-three (233) schools were selected from a total of nine hundred and ninety-eight (998) schools.

Table 3. Number of Schools Selected from Each District in UER for the Study

District	Primary	JHS	SHS/SHTS	Total
Bawku Municipality	14	14	4	32
Bawku West District	8	8	2	18
Bongo District	10	10	2	22
Bolga Municipality	16	16	6	38
Builsa North District	4	4	3	11
Builsa South District	2	2	1	5
Garu District	7	7	1	15
Tempane District	3	3	1	7
Kassena-Nankani East	12	12	4	28
Kassena-Nankani West	12	12	5	29
Talensi District	7	7	3	17
Nabdam District	5	5	1	11
Total	100	100	33	233

Both probability and non-probability sampling procedures were employed in selecting the sample. The primary schools in the districts were selected proportionately, and by random sampling. The schools were first clustered according to districts in the region. The districts were then given quotas according to the ratio:

number of schools selected from district,

$$n = \frac{233}{998} \times total\ number\ of\ primary\ schools \in the\ district.$$

The figures were then rounded up to the nearest whole numbers.

The JHSs were selected purposively. Every JHS attached to the primary schools selected were also chosen. Others were selected by convenience (say, the nearest JHS to a particular Primary school that

does not have a JHS) to make up the number. The SHSs were selected by census. That is, every senior high school in each district was selected; but only 26 (out of 33) SHSs responded to the study. That made the total to be 226 schools.

The teachers in the selected schools were selected by census. That is, all teachers in selected schools were given questionnaires to answer.

2.3 Instruments

A Teacher Motivation Scale (TMS) was developed after studying the Motivation at Work Scale (MAWS) (Gagné, Forest, Gilbert, Aubé, Morin, & Malorni, 2008) and the principle that less motivated teachers respond the most to performance-based monetary incentives (Segaly, 2006). The MAWS was developed and validated based on the framework of Self Determination Theory (SDT) (Deci & Ryan, 2000). SDT offers a multidimensional conceptualization of motivation that allows the assessment of level of motivation and type of motivation. Conditions supporting the individual's experience of *autonomy, competence,* and *relatedness* are argued to foster the most volitional and high quality forms of motivation and engagement for activities, including enhanced performance, persistence, and creativity.

The TMS was designed as a self-report instrument to be used in professional development, pre-employment, human resources, vocational counseling, job development, work adjustment, job satisfaction, job retention, and in succession planning. It can aid teachers and educational administrators to understand their work motives and values, and apply that understanding to their professional choices and preferred work environment.

Through a focus group discussion with teachers from both first and second cycles schools, and literature review, twenty-four determinants (the socio-economic factors) were taken as factors that gave motivation to teachers. These were used to construct the TMS. It is a four-point Likert Scale with 40 items and sub-items. Items 5 and 6 (made up of 31 sub-items in total) were the ones scored to determine which factors gave the teacher the highest motivational level and which gave the poorest. The highest score for each item meant highly motivating, while the lowest score implied poorly motivating or motivating. A column of the TMS required that the respondent indicate in percentage terms the degree of motivation that they derived from the particular factor.

An interview schedule comprising of 10 open ended questions was also used in data collection. This was employed to increase the depth of the study with the support of higher-level research data. Franken (2001) believes that a person's explanatory attribution style could modify the list of basic needs. Therefore, it was more appropriate to ask people what they want and how their needs could be met rather than relying on an unsupported theory. For example, Waitley (1996) advised having a person imagine what life would be like if time and money was not an object in a person's life. That is, what would the person do this week, this month, next month, if he or she had all the money and time needed to engage in the activities and were secure that both would be available again next year. Then, some follow-up questions are asked to identify what is keeping the person from doing what he would have done now. This open-ended approach is likely to identify the most important needs of the individual. That concept has

influenced the approach of the current study.

3. Results

The percentage of respondents who identified the determinants as motivating, f_e, and the level or degree of motivation (teacher motivation, TM in percentage), that the respondents said they received from the determinants, are represented in Table 4. The results suggest intrinsic and extrinsic factors motivate teachers in the region. In terms of percentage of respondents, f_e, observing "Improvement in achievement of pupil's levels" had the highest responds of 71.4%; while "Salary increases" had the lowest of 25.0%. With respect to the quantity of motivation, TM, that the teachers derived from each determinant, the mean values suggest that "Job security" is highest with a mean value of 82.4%, and "Early retirement" the lowest (20.1%). "Salary" in this case had a significant value of 72.9%.

Table 4. Percentage Responds (f_e) and Degree of Teacher Motivation (TM) of each Socio-Economic Determinant of Motivation

Determinant	% Response that the factor is Motivating (f_e/%)	Mean Degree of Teacher Motivation (TM/%)
Improvement in achievement of pupil's levels	71.4	78.9
Sense of achievement	68.8	71.2
Thank you from pupils	64.3	64.7
Autonomy and responsibility for work	64.2	49.6
Sense of accountability	63.2	51.1
Potential for professional growth	62.8	76.6
Potential for achievement	61.0	57.9
Professional status of teaching	60.1	54.7
Supervision by supervisors	58.0	63.1
Additional equipment and supplies for instruction	57.9	66.9
Teacher evaluation	57.4	43.5
Workshop offered and paid by district	55.4	61.3
Best teacher award in district	54.0	78.0
Factors in personal life	52.9	69.0
Being awarded a plague by pupils	52.0	69.4
Job security	51.9	82.4
Work itself	50.7	65.7
One-time monetary award	50.1	58.4
Recognition	44.5	63.7

Participation in research and curriculum development	41.8	59.6
Early retirement	39.1	20.1
Working conditions	32.3	61.7
District policies	28.5	32.3
Salary increases	25.0	72.9

Scatter plots and the regression lines of f_ϵ and TM are represented in Figure 1, (linear plot, $R^2 = 0.0931$), Figure 2, (power plot, $R^2 = 0.1023$) and Figure 3, (polynomial of order three plot, $R^2 = 0.1375$).

From the linear regression graph (Figure 1), the Pearson correlation coefficient is r = 0.2571 ≈ 0.26; and the coefficient of determination (adjusted), R^2, is 0.093 1 or 9.3%. This predicts a weak association. That is, only about 9.3% of the dependent variable, TM, is explained by the independent variable, f_ϵ. The expectation was a stronger association between TM and f_ϵ, which is contradicted by the results.

For the power plot of TM versus f_ϵ (Figure 2), the coefficient of determination is 0.1023 or 10.23%. Implying that, 10.23% is the measure of the variation of the dependent variable, TM, that is explained by the independent variable, f_ϵ. Thus, the relationship between TM and f_ϵ is more of a power model than a linear model, since the power plot describes or fits the relationship better.

The coefficient of determination between TM and f_ϵ per the polynomial plot (Figure 3) was found to be 13.75%. That is, 13.75% of the variation in TM is explained by the variable f_ϵ. Thus, the polynomial model describes the association between teacher motivation, TM, and the socio-economic variables (intrinsic and extrinsic factors), f_ϵ, better than both the linear model and the power model.
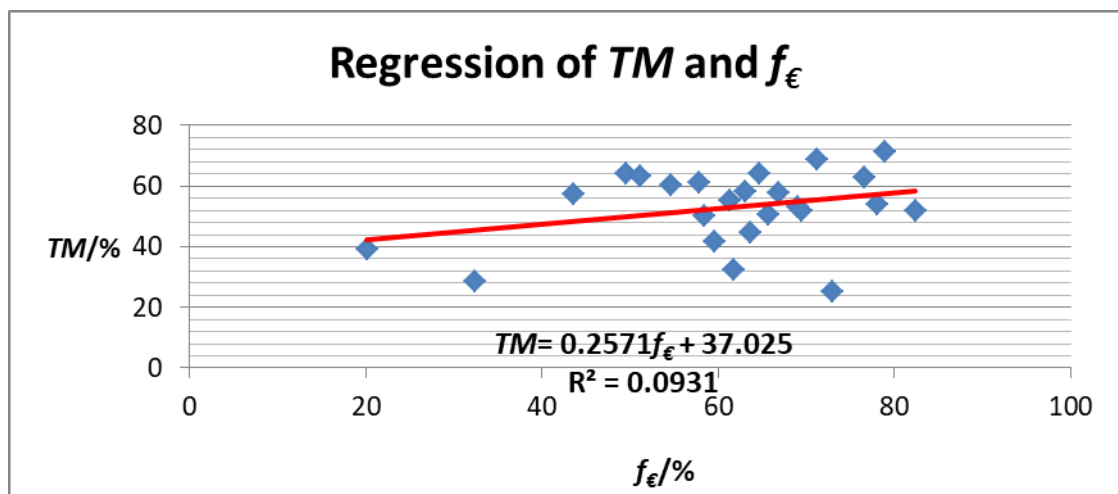

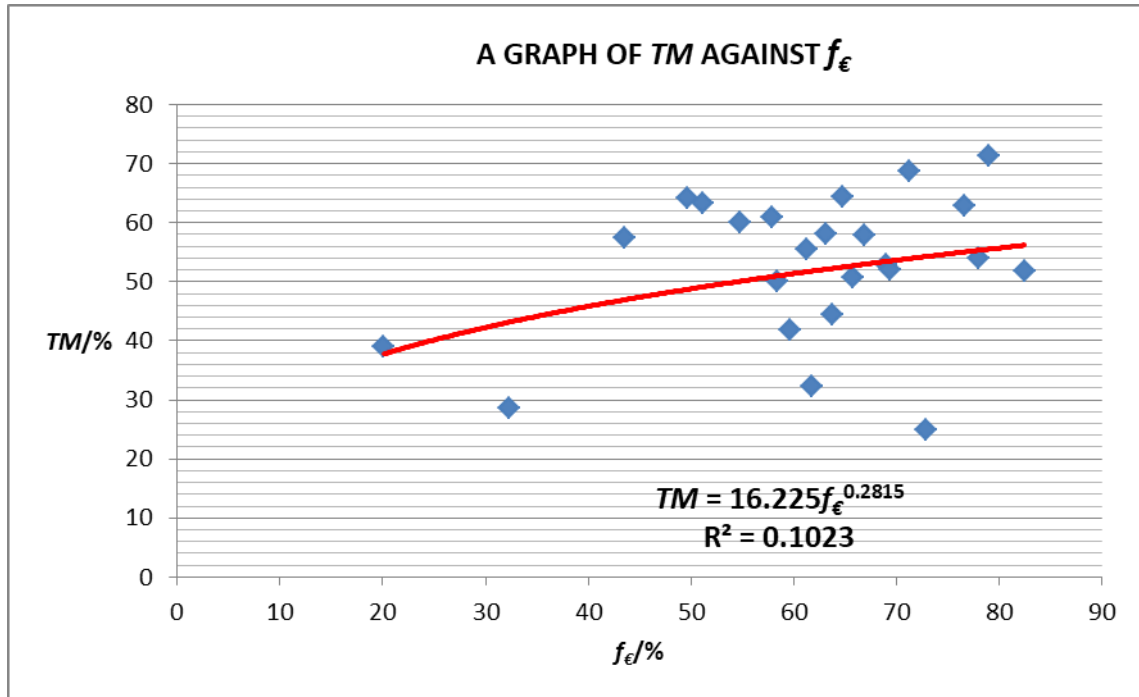**Figure 1. A Linear Regression Graph of TM and f_ϵ**

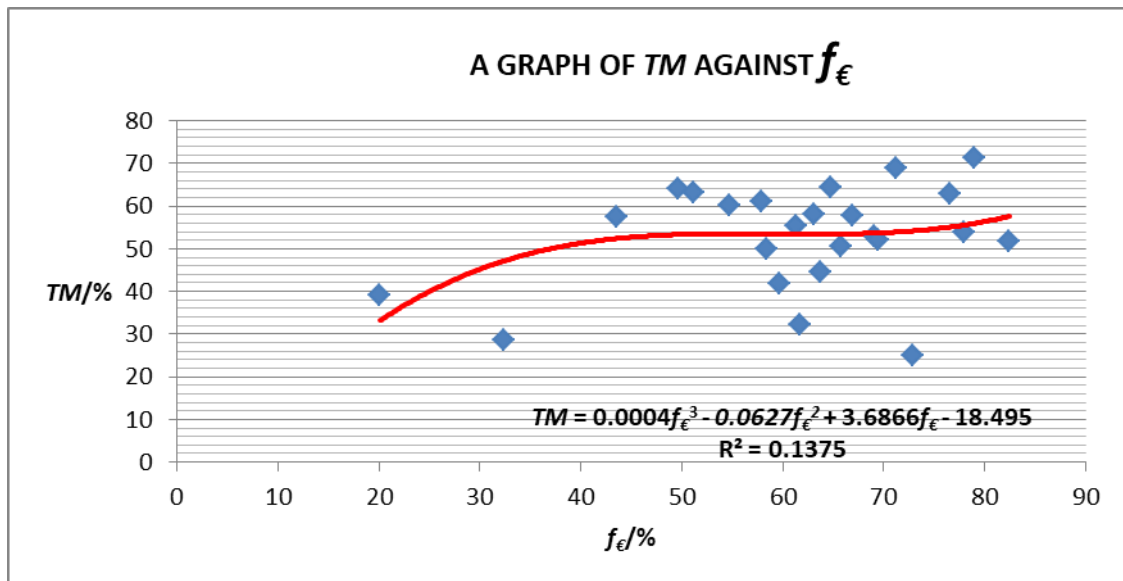**Figure 2. A Power Regression Plot of TM against f_ϵ**

Figure 3. A Polynomial Regression Plot of TM against f_ϵ

4. Discussion

By observing the three plots, it could be deduced that the relationship between TM and f_ϵ seem to be described best by the polynomial relationship. With this model, 13.75% (Coefficient of determination, $R^2 = 0.1375$) of the variation in TM is explained by variation of f_ϵ. The possible explanation for the unexpectedly low correlation between TM and f_ϵ could be explained by the fact that teacher motivation

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is not wholly determined by socio-economic factors. Hence, the very low R^2 value.

Intrinsic and extrinsic socio-economic factors do motivate teachers in the execution of their work in the Upper East Region of Ghana. However, not a strong association exist between teacher motivation and the intrinsic and extrinsic socio-economic variables. Not so much of teacher motivation depends on socio-economic factors. A linear regression does not represent the relationship between *TM* and f_ϵ as well as the power relation does. The linear relation between the two variables is,

$$TM = 0.2571 f_\epsilon + 37.025; R^2 = 0.0931 \text{ or } 9.31\%.$$

That is, only 9.31% of teacher motivation (*TM*) is accounted for by the socio-economic factors (f_ϵ). The power relation between them is

$$TM = 16.225 f_\epsilon^{0.2815}; R^2 = 0.1023 \text{ or } 10.23\%.$$

Showing that 10.23% of *TM* is accounted for by f_ϵ. Thus, the power equation describes the relationship better.

A polynomial relation between the two variables is,

$$TM = 0.0004 f_\epsilon^3 - 0.0627 f_\epsilon^2 + 3.6866 f_\epsilon - 18.495; R^2 = 0.1375.$$

Indicating that 13.75% of *TM* is accounted for by f_ϵ. This describes the association between TM and f_ϵ, still better than both the linear and power relations.

The polynomial relation could be considered as the preferred model for teacher motivation, TM, in terms of the percentage of people who feel motivated by intrinsic-extrinsic socio-economic variable, f_ϵ. If *TM* is represented by M_ϵ, and the constants, $4.0 \times 10^{-4} = \mu_3$, $6.27 \times 10^{-2} = \mu_2$, $3.6866 = \mu_1$ and $18.495 = \mu_0$, then

$$M_\epsilon = \mu_3(f_\epsilon)^3 - \mu_2(f_\epsilon)^2 + \mu_1(f_\epsilon) - \mu_0.$$

Socio-economic factors (intrinsic and extrinsic) are not sufficient motivators of teachers in the Upper East of Ghana. They may initiate teacher motivation, but does not sustain it if they are not sufficiently increased. If the intrinsic and extrinsic factors are non-existent, i.e., $f_\epsilon = 0$, teacher motivation, M_ϵ, will be negative ($M_\epsilon = - \mu_0$). Which is over a negative eighteen percent (-18.495%). Teachers will thus be demotivated if the socio-economic factors are non-existent.

From the above conclusions, the following recommendations are made:

1) Socio-economic factors should be improved for teachers. Especially, factors that would inure to improvement in pupils' performance.

2) Since salary increment gives significant degree of motivation to teachers, salaries of teachers should be sustained at levels that can meet their socio-economic needs.

3) Since the association between the socio-economic factors and the quantum of motivation teachers receive from them is weak, further research should be conducted to identify factors that have stronger association with the degree or quantum of motivation teachers get from them.

References

Amabele, T. (1996). *Creativity in context: Update to The Social Psychology of Creativity*. Westview Press.

Caillods, F. (2001). *Financing Secondary Education in Selected Francophone Countries of Africa: Issues and Perspectives*.

Deci, E. & Ryan, R. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, *55*(1), 68-78. https://doi.org/10.1037/0003-066X.55.1.68

Franken, R. (2001). *Human motivation* (5th ed.). CA: Brooks/Cole.

G.S.S. (2018). Education Statistics: Tracking progress in Ghana's basic level education across the districts. *Journal of Visual Languages & Computing*, *1*(806).

Gagné, M., Forest, J., Gilbert, M. H., Aubé, C., Morin, E., & Malorni, A. (2008). The motivation at work scale: Validation in two languages. *ASAC*, *29*(5).

Lapeniene, D., & Dumciene, A. (2013). Teachers' Creativity: Different Approaches and Similar Results. *Social and Behavioral Sciences*, *2014*, 279–284. https://doi.org/: 10.1016/j.sbspro.2014.01.208

Leonard, N., Beauvais, L., & Scholl, R. (1999). A self-concept-based model on work motivation. *Annual Meeting of the Academy of Management*.

Macdonald, D. (1999). Teacher Attrition: A Review of Literature. *Teaching and Teacher Education*, *15*. https://doi.org/10.1016/S0742-051X(99)00031-1

Segaly, E. A. (2006). Welfare as we should know it: Social empathy and welfare reform. In E. A. S. K. M. Kilty (Ed.), *The promise of welfare reform: Political rhetoric and the reality of poverty in the twenty-first century* (pp. 265–274). Haworth Press.

The Research Advisors, (2006). *Samlpe Size Determination*. http://research-advisors.com/tools/SampleSize.htm

Vroom, V. (1964). *Work and motivation*. New York. Wiley.

Waitley, D. (1996). *The new dynamics of goal setting: Flextactics for a fast-changing world*. William Morrow.