The concept of schools village and the incidence of stress among science teachers

Abstract: The idea of lessening stress among science teachers by creating 'schools villages' is explored. A schools village is a small cluster of schools situated within the same area. The proximity of the schools is intended to maximize the use of resources and to promote good neighborliness. The schools village arrangement is proposed to help alleviate the stress of teachers by providing them with more material support through the sharing of resources and with more social support through greater exposure to colleagues. This idea was tested using data obtained from 368 Nigerian science teachers. The study found that enhanced personnel relations between teachers in schools villages helped reduce stress levels in these five categories of stressors: curriculum, facilities, student characteristics, administrative and professional growth, and self-satisfaction.

The primary interest of this study lay in exploring the potential of the personnel relations in "schools villages" in reducing science teacher stress. The schools-village concept which has a Greek origin and is gaining wide acceptance in many countries of the world, is built on the philosophy of maximum resource utilization and the engendering of communal spirit. Data gathered from 368 science teachers in Nigeria indicate that science teacher interactions in the "schools villages" had a significant depressing effect on stress level on five clusters of stressors: curriculum, facilities, student characteristics, administrative, and professional growth and self-satisfaction. The implications of the results for science teacher welfare and for preparing the citizenry for the science and technology-dominated world of the twenty-first Century are drawn.

INTRODUCTION

The environment in which teaching and learning are conducted, be it at the school or classroom level, has been theorized and empirically demonstrated to influence the attitude of teachers to work, teacher productivity, and students' learning (see reviews by Fraser, 1989; Fraser, in press, Fraser, Docker, & Fisher, 1988). At the level of the school, the findings of several years of research converge in giving prominence to the subject of interactions among teachers as being an important factor in discussions on school climate (Borg, Riding, & Falzon, 1991).

The past decade has witnessed a marked increase in concern about issues dealing with interpersonal relations among teachers (see International Labour Organisation (ILO) reports summarized by Johanson, 1989; Richter, 1989). Within this domain of interest, occupational stress among teachers is a subject that is receiving increasing

attention. This increasing level of concern may be linked with declining achievement levels of students as reported by national and international studies such as the National Assessment of Education Progress in the U.S. (Doran, 1990), the 1985 British Assessment of Performance Unit (Doran, 1990), and the First and Second International Studies in Science (Helgeson, 1988) and Mathematics (Phillips, 1983; Purves, 1989). It is believed that teachers are now being subjected to a great deal more stress than before, a situation that Kyriacou (1987) sees as taking its toll on productivity. Declining teacher productivity, it is said, translates into declining students' achievement (Anderson, 1989; Helgeson, 1988). Selye (1956), one of the early workers in the area of stress, defines stress as a non-specific response of the body to any demand made on it to adapt (what he called the General Adaptation Syndrome). Some stress is seen as being essential to promote growth: what Selye (1974) called "one of the spices of life."

Stress has also been defined as a condition of mental and physical exertion brought about as a result of harassing events or dissatisfying elements in the environment (Okebukola & Jegede, 1989). On a specific note, teacher stress has been defined by Kyriacou (1989) as the experience by teachers of unpleasant, negative emotions such as tension, anxiety, frustration, anger, and depression, resulting from aspects of work as teachers. Stress leads to the lowering of on-the-job performance -- a situation that cannot be tolerated in these days when ways are being sought to improve the quality of teaching in our schools. Dunham (1984) identified three major approaches to understanding the nature of stress in teaching. The first, based on the "engineering" model of stress, looks at the pressures exerted on teachers in schools. The second, based on the "physiological" model, focuses on the teacher's reactions to these pressures, e.g., frustration and headaches. The third approach, based on the "interactional" model of stress, is concerned with the pressures, reactions, and coping resources which teachers use in their attempts to cope with stress. Research on teacher stress indicates that the perception of threat comprises two main stages (Kyriacou, 1989). Stage 1 is when the job demands are perceived by the teacher to be difficult or impossible to meet satisfactorily. Stage 2 is when failure to meet these job demands satisfactorily is perceived by the teacher to be a threat to his or her self-esteem or general well-being.

The most frequently cited sources of stress for teachers generally are: poor working conditions (Okebukola & Jegede, 1989), misbehavior of students (Dunham, 1984), lack of resources for teaching (Smilansky, 1984), overload with non-teaching duties (Payne & Furnham, 1987), and students' poor attitude toward work (Kyriacou, 1987). Cox and Brockley (1984) reported the results of a study in which they found that 67% of the teachers in their sample indicated that their work was the main source of stress as opposed to 35% of the non-teachers in the sample. Cox and Brockley (1984) concluded that "work appears as a major source of stress for working people, with teachers appearing to experience more stress through work than non-teachers" (p. 84). Adding to this growing literature, Coldicott (1985) showed that "difficult individual pupils" and "trying to maintain and raise standards" were the most stressful for teachers in his sample, among a list of 21 possible sources of stress. In

Wilkinson's (1988) survey, it was found that the major sources of stress for teachers were "difficulty achieving desired standards in lessons" "lack of facilities," "daily workload being too great," and "class sizes too large for facilities." The survey of 296 primary school teachers conducted by Spooner (1984) also provided a list of factors which stress teachers. Top on the list were "lack of time with individual pupils," "little time to relax," "visits by inspectors," "insufficient time to complete work," and "dealing with uncooperative pupils." In a recent study involving 710 Maltese teachers, Borg et al. (1991) showed that teachers who reported greater stress were less satisfied with their job and less committed to choosing a teaching career were they to start life over again. On the manifestations of stress conditions, Dunham (1984) reported that "feelings of exhaustion," "irritability," and "tension headaches" were the most frequent indicators of stress by teachers. Wilkinson's (1988) study of 60 teachers also showed that the reactions to stress indicated by the respondents were "irritability," "frustration," "tension," "anxiety," and "disturbed sleep." In his study of stress, Spooner (1984) used five physiological stress indicators --the diastolic blood pressure, pulse rate, palmer sweat index, galvanic skin resistance, and urinary cortisol output. Results showed that these measures displayed an overall increased response to stress during the school term, with periods of reduced stress reaction during the holidays. Spooner (1984) concluded that stress experience increased as the school term progressed.

Handy (1988) sees stress as an individually-based, affect-laden experience, caused by subjectively perceived stressors. Teacher stress, on the other hand, has been defined as the experience by a teacher of unpleasant emotions such as tension, frustration, anxiety, anger, and depression resulting from events or situations within the teaching work environment (Kyriacou & Sutcliffe, 1978).

The major point of view that has traditionally guided research on stress is that all categories of teachers whether science, mathematics, or the humanities are not different in what brings stress to bear on them. The research that is based on this view has constantly overlooked the fact that a differential can in fact exist in what stresses the different categories of teachers. The existence of some common stressors for all the categories is not in doubt however.

The science teacher as claimed by Hoover-Dempsey and Kendall (1982), is subjected to a great deal more stress than non-science teachers. The authors anchor their views on three points. First, students on the average, believe that science is difficult. Their general disposition toward this supposedly difficult subject matter has great potential for stressing science teachers. Second, science teaching involving work in the field, nursery, and laboratory is intensive and fraught with potential dangers for the teacher. Third, science is regarded in many countries as the in-thing, and policy makers are encouraging many more youths to enroll for science-based courses. This means more students for the science teacher and more work and, consequently, more stress. As the twenty-first Century approaches, the science teacher, more than others, is being called upon to give his or her best since the third millennium has been predicted to be one that is dominated by science and technology (Eichinger, 1990; Kyle, 1989).

Science teachers, therefore, should reach a high point of productivity so that the citizenry can be prepared to cope more effectively with life beginning from the year 2001. Thus, if stress among teachers is an issue worthy of being addressed, then of greater importance is the need to address the issue of science teacher stress.

Several lines of research converge indicating that teachers are stressed by personal and environmental factors. In the personal domain, a major source of variance in stress arises from individual differences in vulnerability to the impact of the stressors. These individual differences can be predicted by scores on measures of neuroticism and extroversion and by measures of propensity to experience generally low levels of positive affect and generally high levels of negative affect. Within the area of environmental factors, four clusters of variables have been found to bring stress to bear on teachers. These are: (1) pupil misbehavior, (2) poor working conditions, (3) time pressure, and (4) poor school ethos (Payne & Furnham, 1987). While the research on science teacher stress has identified stressors which can fall within these clusters, the specific stressors within each cluster have been found to be largely different for science teachers (Betkouski, 1981). For instance, stressors that are science teacher-specific are: "having to use obsolete equipment for science teaching," "non-availability of safety devices in the lab," "lack of maintenance facilities for lab equipment," "students' poor performance in science subjects relative to other school subjects," "students' lack of materials for laboratory use such as lab coats or dissecting sets," "fear of getting wounded or contracting diseases in the lab," and the "non-payment of science-teaching allowance" are science teacher-specific.

Evidence from the research efforts on science teacher stress suggests strategies such as meditation and relaxation and engagement in leisure-time activities for palliating stress (Betkouski, 1981; Penny, 1982). These would appear to be after-school remedies. Very scant efforts have been directed at investigating ways of alleviating stress during school. This line of research is important insofar as the stressors are expressed during school hours (Kyriacou, 1987). The relationship between the schools-village arrangement and the level of science teacher stress was examined in this study.

THE CONCEPT OF "SCHOOLS VILLAGE" A schools village is a small community of schools, usually between two and five, located within the same perimeter (Lipka, 1986). The concept has a Greek origin as the Greeks were known to have set up schools in clusters primarily to facilitate the development of good neighborliness and healthy competition among the youths (Carrier, 1984). The Romans were also known to have copied the model from the Greeks. In modern times, the communist countries have demonstrated great potential to adopt the schools-village model. To some degree, Sri Lanka (Baker, 1989), Tanzania (Moshe, 1988), Japan (Shimahara, 1986; Hiro, 1986; Duke, 1986), and Nepal (Sharma, 1989) attempt to use the schools-village model.

The schools-village concept is built on the philosphy of maximum resource utilization and the engendering of communal spirit. According to Carrier (1984) and

Sharma (1989), the component schools in the village, by virtue of proximity, are able to pool resources in such a way that no school experiences severe lack of human and material resources. With agreement reached on time-tabling, the schools can put to more efficient use the teaching materials and personnel present within the schools' village community without each school necessarily losing its identity. Thus, the "schools village" arrangement can help to lower teacher stress on two important sources (1) greater availability of material support through sharing of resources, and (2) greater availability of social support through extra contacts with others who share similar values.

The human elements in a school village -- principals, teachers, support staff, and students, have the tendency to develop a good measure of communality (Carrier, 1984). If for no other reason, the fact of being enclosed within the same premises for about 6 hours every school day, is sufficient to bring such communality about. The establishment of schools village started gaining prominence in Nigeria in 1979. The idea of free education at all levels which motivated the formation of such schools, started as an election issue of the Unity Party of Nigeria in that year. In Lagos State especially, the idea gave leverage to the establishment of schools villages by the Jakande Administration of 1979-1983 and given a lot of polish by the Mudashiru regime between 1984 and 1986. Every Local Government now has at least five such schools villages. Each schools village has a minimum of three schools enclosed within its perimeter. Each school in turn has its own principal, and on the average, there are 28 teachers and 600 students enrolled in the junior and senior secondary classes. On the average, there are eight science teachers in each school. Laboratory facilities and introductory technology workshops are provided for each school in the village.

THE PROBLEM The primary interest in this study lay in exploring the potential of the personnel relation dimension of the schools village in reducing science teacher stress. The study was structured so that the issue of sex of the science teacher and school location, theorized in a previous study (Okebukola & Jegede, 1989) to affect stress, could also be addressed. It was our expectation that science teachers in the schools village will report lower average levels of stress when compared with science teachers in other teaching settings.

METHODOLOGY Sample Three hundred and sixty-eight science teachers in 68 schools were randomly selected from those who have been teaching in their present posts for at least 3 years. 195 of the teachers (69 female, 126 male) were teaching in 38 schools located within eight schools villages. Four of the schools villages are located in urban areas while the other four are rural schools villages. 173 teachers (51 female, 122 male) were drawn from 30 non-schools village schools (15 urban, 15 rural). All the schools selected were established in 1980 and had almost identical laboratory facilities. The 368 science teachers had comparable teaching experience (6-8 years) and qualifications (a first degree in their teaching subject with a qualification in education).

Measures The Occupational Stress Inventory for Science Teachers (OSIST), developed by Okebukola (1988) was used for collecting data on science teacher stress. This instrument was developed from an earlier version with 53 stressors. The version used in this study has 25 stressors which had eigenvalues loading highly on five factors labeled as: curriculum, facilities, student characteristics, administrative, professional growth, and self-satisfaction. Each factor has five component stressors which exhibited the top five eigenvalues for that factor. The list of 25 stressors follows:

Curriculum

1. Overloaded science syllabus.
2. Not enough periods on the school time-table for effective science teaching.
3. Having to teach traditionally difficult topics.
4. Inadequacy of good science textbooks for students' use.
5. Having to teach subjects like Integrated science that one is not specially trained for. Facilities
6. Having to use obsolete equipment for science teaching.
7. Too many students and not enough equipment.
8. Lack/inadequacy of instructional aids like projectors for science teaching.
9. Non-availability of safety devices in the lab.
10. Lack of maintenance facilities for lab equipment. Student characteristics
11. Stealing of laboratory equipment and materials by students.
12. Students' demonstrated lack of interest in science.
13. Students' poor performance in science subjects relative to other school subjects.
14. Students' lack of materials for use in the lab such as lab coats and dissecting set.
15. Carelessness in the use of laboratory materials leading to breakages. Administrative
16. Having to comply with decisions taken without consultations with the science teachers.
17. Scheduling of science classes at awkward periods.
18. Principal's reluctance to discipline misbehaving students.
19. Inadequate budget for the science department.
20. Having to work with a Principal without a science background. Professional growth and self-satisfaction
21. Lack of opportunity to attend in-service training.
22. Delay in promotion.
23. Non-payment of science teaching allowance.
24. Limited time for leisure and relaxation.
25. Fear of getting wounded or contracting diseases in the lab. Each of the 25 stressors on OSIST is put on a 4-point scale--extreme stress, moderate stress, very mild stress, and no stress (following Kyriacou, 1987). The respondent is expected to tick a point on the scale that agrees with the degree to which the listed stressor brings stress to bear on him or her. A score of 4,3,2, and 1 was given for extreme stress, moderate stress, very mild stress, and no stress, respectively. A range of scores of 5-20 was obtainable for each of the five factors on OSIST and 25-100 for the entire instrument. Subscale reliabilities (alpha) range between 0.79 and 0.91. Alpha for the

entire instrument for the sample of the study was found to be 0.83. Procedure OSIST was administered to the teachers during visits to the schools between January and February 1989. Follow-up interviews were conducted for eight teachers in the sample--two from an urban schools village, two from a rural schools village, two from an urban non-schools village school, and two from a rural non-schools village school. In each case, a male and a female were randomly selected. The interviews were held to shed more light on the responses of the subjects. Each interviewee was asked to explain or justify his or her response with respect to each of the 25 items on OSIST. The audiotaped interviews were later transcribed and the protocols used to gain better insight into the quantitative data yielded by OSIST.

RESULTS Three scores were obtained for each respondent: first, was the score for each of the 25 stressors, second, was the score for each of the five factors. This an obtained by adding up the scores of the component stressors. Third, a global score was computed by adding up the scores for the five factors. Data for teachers in schools village and non-schools village schools were then coded and analyzed using SPSSPC+.

[TABULAR DATA OMITTED] The data of the study were subjected to a 2 x 2 x 2 ANOVA on the global stress scores for school type (village and non-village), sex of the teacher (male and female), and school location (rural and urban). The results reveal that all the main effects were significant beyond .05. The main effect due to school type recorded the highest F-value and the greatest statistical significance [$F(1, 362) = 18.96$, $p < .001$]. For the sex main effect, the mean total stress score for male (49.63; SD = 5.83) and female (52.82; SD = 6.94) was found to be significant at the .05 level [$F(1, 362) = 6.21$]. School location main effect was also significant at the .05 level [$F(1, 362) = 4.36$]. Science teachers in the rural schools had a mean stress score of 47.25 (SD = 4.89), while those in urban schools had a mean stress score of 51.29 (SD = 6.95).

Two-way interactions between school type and sex and school type and school location did not attain statistical significance. The 3-way interaction among the three variables was however, significant beyond .05 [$F(1, 362) = 5.08$]. A more detailed insight into the results was obtained by comparing the mean scores of teachers in the village and non-village school settings on each of the five factors on OSIST (see Table I). It was found that the schools village science teachers expressed lower stress level than the nonschools village teachers on all the factors: curriculum, facilities, student characteristics, administrative, and professional growth and self-satisfaction. The greatest difference was recorded for stressors under facilities. While the schools village teachers had a mean stress score of 5.20, non-schools village teachers has a mean stress score of 13.01. The statistical significance of this difference was shown by the t-value of 15.60. The least difference between schools-village and non-schools village science teachers was found to be in the area of curriculum.

[TABULAR DATA OMITTED] Table II provides data that are specific for each stressor for schools village and non-schools village science teachers. For curriculum-

related stressors, no significant difference was found between the two groups of teachers with respect to "overloaded science syllabus," "not enough periods on the school timetable for effective science teaching," and "inadequacy of good science textbooks for students' use." Two variables in this category were found to differentially stress the two groups. These are "having to teach traditionally difficult topics," and "having to teach subjects like Integrated science, that one is not trained for." Two teachers who were interviewed stated that: ...teaching difficult topics is no longer much of a problem to us these days. We find out early in the term, the topics that we all feel at home with. When we get to the difficult topics, we call on the expert science teacher in that area to help out with teaching all the classes (teacher from schools village). ... I am not too confident with teaching genetics and ecology. It is unfortunate that these make up good part of the biology syllabus. I do my best in other topics though (teacher from non-school village).

It was found, as reported in Table II, that schools-village and non-schools-village science teachers have significantly different perception of the level of stress brought about by stressors under Facilities. Four out of the five stressors in this category yielded significant t-values. Data in Table II show that schools-village science teachers perceived issues dealing with facilities to cause them little stress. This contrasts with the high mean stress values recorded for non-schools-village science teachers. Interviews and inspection of facilities in both schools showed that in the schools villages, the staggering of practical classes on the timetable permitted each school to take advantage of equipment and materials in other schools in the schools village. For instance, while one or two schools are having chemistry practical classes in the schools village, the other schools are engaged in other subjects. This arrangement made sharing of laboratory materials possible. In some cases, as reported by some teachers who were interviewed, the teacher in another school who is free, lends a hand in the schools where his subject is being taught.

Turning next to the stressor on students' characteristics, data from the study showed that "stealing of laboratory equipment and materials by students" and "students' lack of materials for use in the lab," featured as low stressors to the schools-village science teachers. Interview protocols showed that the students in the schools village acted as "watch dogs" for each other in tune with the communal spirit. They shared materials and resisted stealing or damaging lab equipment.

No significant difference was found between the two groups of teachers with respect to "students' demonstrated lack of interest in science." It is interesting to note that a higher stress value was found for the schools-village science teachers on this variable. For the stressors clustering on administrative variables, no significant difference was recorded for schools-village science teachers in three out of the four variables. The same pattern of results was found for the stressors on professional growth and self-satisfaction. Two points will be emphasized here. First, "inadequate budget for the science department" emerged as the greatest stressor, with a mean value of 3.08 for the schools-village science teachers and 3.06 for the non-schools-village science teachers. Second, the schools-village science teachers had a lower

stress score for "limited time for leisure and relaxation." As discussions with the teachers revealed, the cooperative interaction among the science teachers in the schools villages freed the teachers at different times during the school day for some form of relaxation at school.

DISCUSSION At the outset, the major methodological weakness of the study (quasi-experimental design) should be acknowledged. Subjects were not randomly allocated to the schools village or the non-schools village conditions. In the absence of other evidence, the possibility cannot be ruled out that the teachers in the two conditions differ on the relevant characteristics, e.g., intrinsic motivation in teaching, level of training, and level of relevant experience, which might have resulted in the mean differences in reported stress-related experiences.

With regard to the prediction of the study, quantitative and qualitative data obtained endorsed the correctness of this prediction that science teachers in schools villages will report lower average levels of stress compared with science teachers in other teaching settings (see Tables I and II). The 3-way ANOVA revealed that the schools-village science teachers recorded a lower mean stress score when compared with their colleagues in the non-schools village institutions, in 18 out of the 25 stressors.

Thirteen of the mean differences between the two groups of teachers were found to be statistically significant beyond the .01 level. Interviews conducted with the teachers provided data to pin down the source of the differences, to the schools-village arrangement and personal relations. The interviews revealed the existence of social and professional support among the teachers in the schools village. This appeared to be the predominant active ingredient of the personnel relations in the schools villages.

These results can be further explained by the moderating hypothesis proposed by House (1981). According to the hypothesis, individuals who have supportive relationships are able to rely on others in dealing with stressful situations. As a result, stress does not bear heavily on them. On the other hand, individuals who lack supportive social relationships are vulnerable to stress. Emprical evidence (not provided as hard data in this study) is becoming available to support this hypothesis. For instance, the study by Belcastro, Gold, and Grant (1982) indicates that teachers who were classified as stressed and burned out, spent less time with their fellow workers than did other teachers. Zabel and Zabel (1982) reported that teachers who perceived greater administrative and peer support were less stressed. Also, a survey of a random sample of science teachers in New Hampshire found that higher levels of peer interaction and support at work from colleagues was associated with lower levels of stress (Schwab, Jackson, and Schuler, 1984). In a more recent study of 316 teachers in Iowa, Russell and Van Velzen (1987) found teachers who reported that they had supportive supervisors and colleagues expressing a significantly lower degree of stress when compared with those who do not have such support. The schools-village arrangement and interpersonal relations among teachers in schools in such a set up, were found to provide supportive role for the science teachers in the

study with the possible consequence of lowering their stress levels. Of the five clusters of stressors, stressors clustering on facilities were found to be most predisposing to stressing non-schools village science teachers (Table II). The science education literature is replete with evidence documenting a global trend in facilities shortage and outcry of teachers on possible effects of such a trend on their teaching efforts (see for example Druger, 1986; Yager, 1986). Consequently, the schools village arrangement of resource sharing would appear to have great potential in reducing the magnitude of the effects of facilities shortage in individual schools, including that of science teacher stress. It is worth recognizing that social support is less an environment variable and more of an individual resource as the ability to avail oneself of what social resources are available.

In the schools village, teachers worked out arrangements for maximizing the use of available human and material resources. The school timetable arrangements permitted short-term loan of equipment and materials. Teachers with expert knowledge of a topic also made their services available for teaching such topics in other schools in the schools village, if the regular teacher perceive such topics to be difficult to teach.

On the whole, the quality of collaborative efforts in the schools village exerted a reducing effect on possible stressful events to science teachers in the schools village. The variable of sex was also of interest in this study. We found that the female science teachers in the sample were more stressed than their male counterparts. This is in line with the findings of Greenglass, Burke, and Ondrach (1990). It is believed that women are more likely to be subjected to a greater degree of stress in occupations traditionally perceived to be of male domain in the sciences, engineering, and technology (Case & Richardson, 1990). The more taxing demand of the job, coupled with the demands of the home, have been speculated to be possible explanation for this situation (Linskold, 1978; Long & Gessaroli, 1989).

The main effect due to school location was found to be significant. Urban teachers were found to be more stressed than those in rural areas. This is in agreement with the pattern of results on stress, indicating that non-work-related stressors combine with occupational stress in the cities to exert greater stress on urban workers in comparison with their rural counterparts (Sparks, 1983). We did not explore the interaction of school type, sex of teacher, and school location further since the 3-way interaction F-value failed to attain significance.

In this study, we examined how the schools-village interpersonal relations can be a candidate factor in reducing stress levels of science teachers during the school day. It would appear that the schools-village concept is not a worldwide phenomenon. Also, there may be a downside to the approach in terms of extratravel requirements, the need to interact with and trust more colleagues as well as extra meetings. Therein lies a major stumbling block to the generalizability of the findings of the study. However, what has clearly emerged from the study is the evidence that collaborative efforts, and the sharing of human and material resources in these economically lean times, have great potential for reducing stress during the school day especially among

science teachers. Since collaboration and resource sharing can be a worldwide phenomena, the hinderance to the replication of this study and the generalizability of its findings may not be as harsh after all. Perhaps if the schools-village model is adopted in many other countries, further evidence can be obtained from these countries and others currently operating such models, about the efficacy of the interpersonal relations in such schools villages in making science teaching an exciting, low-stress activity. We may then be assured of greater productivity and better preparation of the citizenry for the science- and technology-dominated world of the twenty-first Century.

(1) College of Business Administration, 326 Baker Hall, Bradley University, Peoria, Illinois 61625.

(2) Requests for reprints should be addressed to Aaron A. Buchko, College of Business Administration, 326 Baker Hall, Bradley University, Peoria, Illinois 61625.

REFERENCES

ANDERSON, B. C. Swedish schools in an international perspective. School Research Newsletter, 1989, 6, 1-10.

BAKER, V. J. What is feasible in village schools of disadvantaged areas. International Review of Education, 1989, 35, 145-158.

BELCASTRO, D. A., GOLD, R. S., & GRANT, J. Stress and burnout: Physiologicaleffects on correctional teachers. Criminal Justice and Behavior, 1982, 9, 387-395.

BETKOUSKI, M. On making stress work for you. Strategies for coping. ScienceTeacher, 1981, 48(3), 35-37.

BORG, M., RIDING, R. J., & FALZON, J. M. Stress in teaching: A study of occupational stress and its determinants, job satisfaction and career commitment among primary school teachers. Educational Psychology, 1991, 11(1), 59-75.

CARRIER, J. G. Education and Society in Marus Village. ERU Report No. 47, ERIC Document No. ED 313269, 1984.

CASE, D. O., & RICHARDSON, J. V. Predictors of students' performance with emphasis on gender and ethnic determinants. Journal of Education for Library and Information Science, 1990, 30(3), 163-182.

COLDICOTT, P. J. Organisational causes of stress on the individual teacher. Educational Management and Administration, 1985, 13, 90-93.

COX, T., & BROCKLEY, T. The experience and effects of stress on teachers. British Educational Research Journal, 1984, 10, 83-87.

DORAN, R. L. What research says about assessment. Science and Children, 1990, 27(8), 26-27.

DRUGER, M. The status of college science teaching. Journal of College Science Teaching, 1986, 15, 177-179.

DUKE, B. C. The liberalization of Japanese education. Comparative Education, 1986, 22(1), 37-46.

DUNHAM, J. Stress in teaching. London: Croon Helm, 1984.

EICHINGER, J. Science education in the U.S.: Are things as bad as the recent IEA Report suggests? School Science and Mathematics, 1990, 90(1), 33-39.

FRASER, B. Twenty years of classroom environment work: Progress and prospect. Journal of Curriculum Studies, 1989, 21, 307-327.

FRASER, B. J. Context: Classroom and school climate. In D. Gabel (Ed.), Handbook of research on science teaching and learning. New York: Macmillan. In press.

FRASER, B. J., DOCKER, J. G. & FISHER, D. L. Assessing and improving school climate. Evaluation and Research in Education, 1988, 2(3), 109-122.

GREENGLASS, E. R., BURKE, R. J., & ONDRACH, M. A gender-role perspective of coping and burnout. Applied Psychology: An Internatinal Review, 1990, 39(1), 5-27.

HANDY, J. A. Theoretical and methodological problems with occupational stress and burnout research. Human Relations, 1988, 41(4), 351-369.

HELGESON, S. L. The second IEA science study: Data related to precollege science in the USA. ERIC/SMEAC Science Education Project No. 1, 1988, 1-4.

HIRO, T. Towards a revolution in Japanese education: A critique of privatization and proposal for the recreation of public education. Comparative Education, 1986, 22(1) 31-36.

HOOVER-DEMPSY, K. V., & KENDALL, E. D. Stress and Coping Among Teachers: Experience in Search of Theory and Science. Final Report to George Peabody College for Teachers, Nashville, Tenn., ERIC Document No. ED 241503, 1982.

HOUSE, J. S. Work stress and social support. Reading, MA: Addison-Wesley, 1981.

JOHANSON, R. K. Vocational Training for Self-Employment: ILO's Experience in Africa. Paper presented at the International Vocational Education and Training Association Convention, Orlando, Dec. 4, ERIC Document, ED 313853, 1989.

KYLE, W. C. Towards Conceptual Change in Science. Workshop presentation at the 29th Annual Conference of STAN, Minna, August 21-27, 1989.

KYRIACOU, C. Teacher stress and burnout: An international review. Educational Research, 1987, 29(2), 146-152.

KYRIACOU, C. The Nature and Sources of Stress Facing Teachers. Paper presented at the 3rd European Conference on Research on Learning and Instruction held at the Universidad Autonoma de Madrid, Spain, September 4-7, 1989.

KYRIACOU, C., & SUTCLIFFE, J. A model of teacher stress. Educational Studies, 1978, 4, 1-6.

LINSKOLD, S. Trust development, the GRIT proposal and the effects of communality acts on conflict and cooperation. Psychological Bulletin, 1978, 85, 772-793.

LIPKA, J. School-community partnerships in rural Alaska. Rural Education, 1986, 7(3), 11-14.

LONG, B. C., & GESSAROLI, M. E. The relationship between teacher stress and perceived coping effectiveness: Gender and marital differences. Alberta Journal of Educational Research, 1989, 35(4), 308-324.

MOSHE, H. J. A reassessment of the indicators of primary education quality in developing countries: Emerging evidence from Tanzania. International Review of Education, 1988, 34, 17-46.

OKEBUKOLA, P. A. O. The development and validation of the Occupational Stress Inventory for Science Teachers. The Science Teacher, 1988, 3(8), 211-236.

OKEBUKOLA, P. A. O., & JEGEDE, O. J. Determinants of occupational stress among teachers in Nigeria. Educational Studies, 1989, 15(1), 23-36.

PAYNE, M. A., & FURNHAM, A. Dimensions of occupational stress in West Indian secondary shcool teachers. British Journal of Educational Psychology, 1987, 57, 141-150.

PENNY, M. S. Coping with stress London: MacMillan, 1982.

PHILLIPS, R. W. A general overview of the Second International Mathematics Study. Proceedings of the Open Session on the IEA General Assembly, 1983, 8-20.

PURVES. A. D. International comparison and educational reform. Alexandria, Va: Association for Supervision and Curriculum Development, 1989.

RICHTER, L. Improving employment and manpower information in developing countries: Results and lessons of an ILO Technical Program. International Labor

Review, 1989, 128(5), 661-673.

RUSSELL, D. W., & VAN VELZEN, D. E. A. Job-related stress, social support and burnout among classroom teachers. Journal of Applied Psychology, 1987, 72(2), 269-274.

SCHWAB, R. L., JACKSON, S. E., & SCHULER, R. S. Education burnout: Sources and Consequences. Paper presented at the Meeting of American Education Research Association, New Orleans, 1984.

SELYE, H. The stress of life. Toronto: McGraw-Hill, 1956.

SELYE, H. Stress without distress. Philadelphia: Lippincott Co., 1974.

SHARMA, M. P. Rural Education: A Case Study of Two Districts in Nepal. Paper presented at the Community Development Society meeting, St. Louis, MO, July 23-27; ERIC Document No. ED 317338, 1989.

SHIMAHARA, N. K. The cultural basis of standards in Japan. Comparative Education, 1986, 22(1), 19-26.

SMILANSKY, J. External and internal correlates of teachers' satisfaction and willingness to report stress. British Journal of Educational Psychology, 1984, 54(1), 84-92.

SPARKS, D. Practical solutions for teacher stress. Theory Into Practice, 1983, 22(1), 33-42.

SPOONER, M. J. The Implications of the Stress Experience for Planning and Management in Primary Schools. Unpublished M.Ed thesis, University of Leicester, 1984.

WILKINSON, G. R. Teacher stress and coping strategies. School Organization, 1988, 8, 185-195.

YAGER, R. E. Searching for excellence. Journal of Research in Science Teaching, 1986, 13 209-217.

ZABEL, R. H., & ZABEL, M. K. Factors in burnout among teachers of exceptional children. Exceptional Children, 1982, 49, 261-263. Article A13312986

Author: Peter Akinsola Okebukola.

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