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Getting onto and off the Postgraduate Supervisor Register

Margaret Zeegers and Deirdre Barron

Abstract

This paper focuses on the registration of supervisors as a crucial element in constructs and practices of postgraduate studies in Australian universities. It examines two processes in a number of Australian universities postgraduate divisions' practices in compilation of postgraduate supervisor registers-how people get onto the register, and how people get off it. It takes issue with the reliance on custom and tradition as a dominant practice of registration and/or deregistration for supervision of postgraduate research studies. It suggests a model of supervisor registration and deregistration as intentional and systematic intervention, based on literature deriving from research in postgraduate supervision which acknowledges the problematic natures of relationships between teaching, learning and knowledge production. In doing so, it examines issues of discursive practice and the problematic nature of power differentials in supervisor/supervisee relationships and the possibilities presented by both registration and deregistration for such relationships.

Supervisor Registration

In response to the Australian Federal Government's introduction of Australian Universities Quality Agency (AUQA) review of universities, many universities introduced Supervisor Registration. The principles that tend to underlie such registrations are Quality, Sustainability and Protection of students. These are laudable in their intent, and are positioned within discourses of research student activities as part of the shifting higher education discourses that frame such work as Research Training (Kemp, 1999a, 1999b). In practice, registration is fraught with problems in terms of achieving the outcomes desired. Our research indicates that only two universities had, in 2003, elected not to introduce a Register of Postgraduate Supervision. Interestingly, these same two universities were the same ones who had prevented postgraduate supervisors from taking on new students. Universities who do have such a register have not yet found a way to deregister supervisors.

We examined twenty universities' registers in Australia to investigate their approaches to the question of systematic organisation of the supervision they provide. All registers focussed on learning to supervise via a mentoring process, where the trainee supervisor became competent in supervision through the avenue of associate supervision under the direction of a supervisor who had been supervised at least one postgraduate student through to completion of a higher

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degree by research in the past. This takes no regard of any non-completions in the past.

Even as this is done, it takes no cognisance of problematic aspects of such previous supervision (Barron & Zeegers, 2002). A major concern for us is the lack of compunction for any supervisor to treat the registration as anything different from a bureaucratic imposition; indeed it is not in supervisors' interests in terms of promotion or other professional protocols, to admit of any shortcomings, even those based on reflective practices exhorted by university authorities in other areas of teaching and learning. Yet we are mindful that without further exploration and development registers may well be no more than bureaucratic impositions. We are concerned that the simplistic answer to issues around supervisor training, and registration, may end up relying on training models that could be seen as 'tick a box' training. And this without asking some very pertinent questions: Has a supervisor attended induction? Has a supervisor attended training regarding policies? While we would not want to deny the importance of these types of training, they do not address the fundamental issues of pedagogical practices.

We want to stress that simplistic models of educational development often marginalise the academics who are pivotal to the process. Our concern is to avoid simplistic responses to complex issues involved in postgraduate supervision and concentrate on how to increase the level of real communication between within disciplines and across disciplines. However, as McWilliam (1999) points out, establishing interdisciplinary dialogue across a university tends to become instruction by expert to non-expert, and the definition of expert may have more to do with privileged position than real knowledge. At another level ‘instruction by an expert’ is often instruction by an administrator such as records and/or enrolment officers, the IT trainers, and so on. One effect of this is that of non-academic administrators acting as developers of academics who are framed as deficit in regard to leadership, management and applying various policies and procedures. Resistance is hardly avoidable in such circumstances.

Such instructional models tend to raise levels of resistance rather than encourage supervisors to become learners within a collegial space. While the rhetoric of collegial support pervades the university sector, in practice collaboration requires time and space. What is lacking is a safe place for supervisors to talk about their pedagogical practices, engaging the complexities of teaching and learning in the area of research undertakings, learning from each other and sharing positive as well as negative experiences in their roles as leaders of research education. There is therefore no sense of a community of scholars from which to derive inspiration or even practical solutions to problems encountered (Zeegers & Barron, 2000), nor is there any systematic approach to ensuring that the essential solipsistic concerns of supervision may be opened up for critical examination, review, discussion, and change. There is not even any acknowledgement that one does not need to be sick to get better. There is, in short, no support to be given or to be derived from collective expertise, which undoubtedly exists within universities everywhere, based as they are on collegiality.

Deficit Discourses

Discourses of traditional academic expertise construct supervision as sacrosanct, inviolate, beyond question or critique, thereby normalising the positions taken up by supervisors in traditions so eloquently represented by Connell (1985). In effect such discourses construct postgraduate students as naïf, at the same time as they construct supervisors as addressing the deficits implicit in such naïveté. New supervisors, then, are registered as continuing such traditions of correcting deficiencies, reinforced by a supervision tradition of essentially private transactions between the parties concerned. Getting onto the register, then, means demonstrating success in having taken up these positions.

The deficits apply only to the students, however. The supervisor had demonstrated competence under the guidelines of the register, that is, successful completion by one research student, with the mentoring of one principle supervisor, who may also have the same sort of single experience, ignoring the possibilities provided by diversity of candidate, experience, fields, and so on implicit in a graduate school. Even then, the deficit experience can be further weakened by subversion of the register system. There are as many ways of subverting the registration process as there are candidates in the field. A Head of School, a Dean or Director of Graduate Studies or any person with such type of authority can, for example, admit someone to Associate Supervision when a candidate is near completion. Once the candidate completes, the Associate Supervisor is now eligible for Principle Supervision on the basis of what may be less than a month as Associate: no training, no reflection, no discussion, no real experience really, but nonetheless registered with a sacrosanct stamp of official approval.

The Value of Deregistration

That is not to say that deregistration is the general situation. What we have suggested here is not the case across the Australian university spectrum. The advantages of the Register may be questionable in the light of the foregoing, but such advantages also raise possibilities for achieving just what they say they intend. Quality and sustainability of supervision, with protection of research students are laudable aims. What is lacking is the scaffolding necessary to help to ensure the achievement of these. An important feature of this is the mechanisms for deregistration where the intentions have indeed been deliberately subverted (a sin of commission), or where neglect has meant that aims have not been met (a sin of omission).

At present, supervisors have cause to think that it is their right to supervise; it is seen as part of their academic privilege, part of their academic status well beyond the day-to-day minutiae of lectures, tutorials, and administration. In fact, postgraduate students contribute to centres of excellence, part of publications records of supervisors, funding and resources for departments within universities,

resources for academic activities. Postgraduate supervision is integral to certain privileges within academia. If one is not allowed to supervise, likely impacts upon such things as the ability to generate funded research projects, funding for international conferences, consultancy and research work supported by one's research students, the list goes on and on. These impacts on one's work may generate dilemmas around industrial relations issues and academic progression. Yet not to deregister supervisors is, as it stands, impacting upon the very aims that the register purports to work towards.

Possibilities

It is possible to open up constructs of supervision practice. The present situation of reliance on Connell-type (1985) custom and tradition as privileged practice of registration simply does not countenance deregistration. None of the registers examined includes such provisions, after all. Discussions between Deans and Directors of Graduate Studies (DDOGS) suggests that all Australian universities are grappling with this issue, a major concern of theirs being the industrial relations and associated issues. It means consideration of supervisor rights vis-à-vis postgraduate student rights; supervisors' needs vis-à-vis university needs; financial needs vis-à-vis academic needs, and so on. It is by no means a straightforward matter of deregistering supervisors who do not perform according to university stipulations: and these right now are retentions of research students, and timely completions. These are discourses of administrators—none of this even allows for discourses of teaching and learning and diversities within student populations. The needs of such students as International, women, migrant, working class, and so on do not even figure in such discourses. Discursively speaking, such students are, no less than Indigenous Australian students, the subjects of research training rather than participants in it (McConville, 2002).

Conclusion

We advocate an academic environment that acknowledges that not everyone is a born teacher, but that teaching is a skill that can be learned. While taking seriously educational designs that improve learning environments (see for example Hill and Crevola, 1997) as fundamental to quality teaching, we argue that use of de-registration from the supervisor register must also be used. We argue that if academics are not willing, or are unable, or simply do not know how to take seriously their duty of care to students and a commitment to improving pedagogical practices, then they do not have a right to supervise students.

This need not be personally or professionally catastrophic for the people so affected. There is always the possibility of avenues opening up for research-only careers in academia, where academics are deregistered as supervisors and only conduct research. Another is to use deregistration as an opportunity for academics to learn how to teach; a hiatus in registration to enable engagement with pedagogies associated with discipline areas and research protocols. It is not impossible that academics, especially those who do not have a teacher-based background, engage pedagogical concerns, issues and strategies. It is possible to use deregistration as an enforced training period for such purposes as part of

universities' commitments to enhancing the quality of their teaching as part of systematic quality upgrading, without incurring industrial relations repercussions.

Such learning may be radical for some, but there is also the possibility of systematically creating that sort of space to encourage supervisors to become learners within a collegial space. It is possible to acknowledge, name and frame the necessary institutional practices which develop those sorts of safe spaces to be claimed as their right by supervisors. Professionally and personally secure, systematically organised, pedagogically informed and thoughtful, reflective spaces where pedagogical practices, complexities of teaching and learning in research collegial learning and sharing, as well as the time needed for all of this, are not impossible to achieve. Suggestions such as those of Palmer (1998), the very title of whose work suggests the crucial dimension of what it means to teach, may serve to guide explorations of such spaces. He suggests pedagogical conversations, themselves rather more than discussions of technique or strategy, as means of engaging pedagogical issues. He also offers what he calls critical moments workshops, as well as Clearness Committee possibilities, derived from understandings of Quaker-type engagements with problematic areas. There are also communities of practice models to follow (see for example Wenger, 1999). Many such models, designed to avoid 'instruction by experts' pitfalls, provide the means by which we may explore relevant, timely and appropriate applications to postgraduate research supervision issues. This can only be done, however, once the register is no longer constructed as more than it is: a bureaucratic implement. It means that we must have the possibilities of deregistration embedded as part of postgraduate research supervision protocols. We have previously (Barron & Zeegers, 2002) argued for pedagogy rather than osmosis to guide postgraduate research supervision. While we advocate the utilisation of programs that treat academics as knowing professionals with needs for professional development, we also argue that academics who resist taking pedagogy seriously should not be allowed to supervise Higher Degree by Research candidates.

Bibliography

Barron, D. & Zeegers, M. (2002). 'O" for Osmosis; 'P' for Pedagogy; Fixing the Postgraduate Wheel of Fortune. P. Jeffrey (Ed.). Paper presented at the Problematic Futures: AARE Annual Research Conference, St Lucia, Qld. Australian Association for Research in Education CD-ROM.

Connell, R. W. (1985). How to supervise a PhD. Vestes, 2 38-41.

Hill, P. W. & and Crévola, C. A. M. (1997) The Role of Leadership and Professional Development in a Design Approach to School Improvement. Paper presented at the Conference of the Hong Kong Educational Research Association, The Chinese University of Hong Kong: November. Faculty of Education: The University of Melbourne

Kemp, D. (1999a). New knowledge, new opportunities: A discussion paper on higher education research and research training. APGS, Canberra: Department of Education, Training and Youth Affairs.

Kemp, D. (1999b). Knowledge and innovation: A policy statement on research and research training. AGPS, Canberra: Department of Education, Training and Youth Affairs.

McConville, G. (2002). Regional agreements, higher education and representations of Indigenous Australian reality. Australian Universities Review, 45(1): 15-24.

McWilliam, E. (1999) Pedagogical Pleasures. Peter Lang, New York

Palmer, P. J. (1998). The courage to teach: Exploring the inner landscape of a teacher's life. San Francisco: Jossey Bass.

Wenger, E. (1999). Communities of practice: Learning, meaning and identity. Cambridge: Cambridge University Press.

Zeegers, M. & Barron, D. (2000) More than an Apprenticeship Model: Legitimate Peripheral Participation and the Postgraduate Research Conference. In M. Kiley & G. Mullins (Eds). Proceedings of Making Ends Meet: Quality in Postgraduate Research Conference, Advisory Centre for University Education. Adelaide, April 9-11, pp. 49-55. http://www.canberra.edu.au/celts/QPR/Bytitle.html#M

Bionotes

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New Policy in Teaching Mathematics and Science in Malaysian Secondary Schools

How it contributes to Teachers' Stress

Habibah Elias and Zaidatol Akmaliah Lope Pihie

Abstract

In view of the crucial role of English as the medium of communication in the era of globalization, the government of Malaysia has introduced a new policy recently regarding the use of English as a medium of instruction in the teaching of mathematics and science. All major examinations at the primary, secondary and upper secondary will be in the English language in the future. This involves a major change in policy as English has been taught as a second language for over three decades. In its first year of implementation, it is expected that teachers and students will have to make major adjustments in the teaching and learning process. A study was conducted by selecting a sample of 161 secondary school teachers who are teaching mathematics and science using English as the medium of instruction. Data were collected using open-ended questionnaire. The objective of the study was to examine how the new policy in the teaching of science and mathematics using English has contributed to stress experienced by teachers. The data were analyzed qualitatively using the phenomenological approach. Findings indicated that there were at least six main factors which contribute to teachers' stress, namely teachers' incompetence in English language and the use of computers in teaching, students' level of acceptance, management of time and facilities for teaching, close supervision by authorized personnel, work load and students' performance. The implications of the findings are discussed for improving teaching and learning.

Introduction

Stress is defined by Hans Selye, a physiologist renowned in the area of stress since 1930s, as the non-specific response of the body to any demand made on it. Stress reactions can occur to either internal, cognitive stimuli or external, environmental stimuli. The body is always in some state of stress, whether pleasant or unpleasant, mild or severe. Anything placing a demand on the body can cause stress. When stress is beneficial, such as moderate exercise, it is called eustress and when it is objectionable, as from chronic illness, it is called distress (Seyle, 1974). The word 'stress' refers primarily to harmful or unpleasant stress (distress).

Occupational stress has been widely researched for the last decade, reflecting concern for the detrimental effects that certain organizational and job characteristics may have on the employees. Among sources of job related stress

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include work overload (Zohar, 1995), underutilization of skills (Lancero and Gerber, 1995) and lack of participation (Leiter & Maslach,1988). These stressors can result in numerous negative attitudinal and behavioral outcomes such as job dissatisfaction, job related tension and anxiety, lower performance and a greater propensity to leave the organization (Zohar1995). Stress related problems among workers can also lead to dysfunctional organizational consequences such as increased absenteeism and turnover as well as lower productivity and morale (Perkins,1994).

A study by Briner (2002) on real situations, found 14 factors were associated with occupational stress. These are workload, communication, homework balance, team working, performance feedback, role ambiguity, training and development, job insecurity, job design, management support, skill underutilization, effort-reward imbalance, tools and equipment and hours of work. Among the above factors, workload (in terms of quantity, quality and time pressures) and dealing with people have been identified as the prime causes of stress at work.

Without dispute stress also occurs in the teaching profession. What causes teachers to be stressed? According to Johnstone (1989) many researchers attributed the major causes of stress among teachers to:

- Pupils' failure to work or behave.
- Poor working conditions, generally in terms of relations with colleagues.
- Workload in terms of overload, under load or routine work.
- Poor school ethos.

In a number of studies, change itself is implicated in teacher stress as it can be a problem or challenge. Collaborative networks would give teachers more influence over change and increase their feelings of engagement with the change. The relationship between change and workload has been demonstrated. For example, Timperley and Robinson (2000) cite research which shows that as local involvement in management of schools increased, the percentage of time teachers spent in non teaching duties rose from 42% in 1971 to 56% in 1990 (Campbell & Neil, 1992).

Another aspect of change which may be associated with stress is the drive to improve school standards. Previous research suggests that the period after inspection can be quite traumatic, with teachers feeling of exhaustion, burnout, lack of motivation and even depression (Ferguson, 1999). A high proportion of teachers in two studies reported feeling stressed most of the time during the current school year and increase in sickness as well as time off work.

In summary, teachers believe that their workload has increased considerably during the past decade, largely attributable to an increase in the paperwork now expected of them. However Timperley and Robinson (2000) pointed out that workload on its own is not necessarily a problem as many teachers do cope mostly by working longer hours. As workload such as hours of teaching and preparation, is commonly associated with increased stress, teacher burnout and low job satisfaction, it cannot be ignored.

Teachers' stress may have an impact on teachers as individuals, on the schools in which they work and on the pupils they teach. It is also estimated to have an economic impact on the education system in terms of loss teaching time and additional costs of replacement teachers. Tavers and Cooper (1996) reported that 66% of their sample of teachers had actively considered leaving the profession in the previous five years. In another study, Troman (1998) cites the National

Association of Head teachers which reports that four out of five headteachers in England are opting for early retirement and reporting burnout in their forties.

The objective of the present study was to examine school teachers' stress with the introduction of a new policy regarding the use of English as a medium of instruction in the teaching of mathematics and science. In addition the study also examined the factors related to teachers stress in teaching mathematics and science in English.

In Malaysian schools, English has been taught as a second language for years and the Malay language has been the medium of instruction for schools and universities. In view of the pertinent role of English as the medium of communication internationally as well as the medium for seeking knowledge in the borderless world, the Malaysian Government has recently introduced the new policy regarding the teaching of mathematics and science using English as the medium of instruction. This involves a major change in the curriculum and in its first year of implementation the teachers and students have to make major adjustments in the teaching and learning process. During the first year, the change involves all students in standard one, Form One and Lower Six. All major examinations at the primary, secondary and upper secondary will be in the English language in the future.

This paper will present findings on the following research questions:

- Do teachers teaching mathematics and science in the English language experience stress?
- What are the factors that contribute to teachers' stress?

Methodology

This is a form of action research to explore teachers' perception on their feelings of stress in relation to teaching mathematics and science in English language. Since the Malay language has been the medium of instruction for over three decades, the new policy has raised some conflicts. This necessitates a research to be conducted in order to understand the real situation in the classrooms. Teachers from selected secondary schools were surveyed during the first year of the implementation of the teaching and learning of Mathematics and Science in English. A total of 161 questionnaires were distributed to selected teachers by graduate students majoring in Educational Administration as part of their project paper in the November Semester 2002/2003. The graduate students were teaching in secondary schools and data were collected from teachers who were teaching Form One mathematics and science in their schools. Data were collected via open-ended questionnaire regarding the factors which contribute to their stress in teaching mathematics and science in English. Data were analyzed qualitatively using the phenomenological approach. Teachers' responses to the questions were analyzed thematically. The themes were categorized into six areas namely: students' level of acceptance, management of time and facilities, teacher incompetence, work load, monitoring by authorized personnel and students' performance.

Findings

Stress Among Teachers Teaching Science and Mathematics

Majority of respondents reported that they experienced stress in a number of ways. About 92.5% teachers surveyed experienced stress, while only 7.5% of the teachers did not experience stress given similar tasks. The findings indicate that teachers perceive that they experience stress.

Table 1
Frequency of Stress among Teachers

Mathematics and Science Teachers	Frequency(*f*)	Percentage(%)
Experience Stress	149	92.5
Free of Stress	12	7.5

The above table indicates that stress among teachers is a common phenomenon. They have described their teaching experience in terms of their competency in using English and the subject matter involved. The students' acceptance of the new teaching approach and related matters have also contributed to their stress. The teachers have expressed concern over several factors both pedagogical and psychological in nature.

The group pf teachers who did not experience stress form the minority (7.5%) in the study. They are positive in their approach to the teaching and learning of mathematics and science in English.

Examples of statements from teachers who did not experience stress are as follows:

> "I enjoy teaching in English, my students are interested to learn in English" (S058).

> "Students can change with good and effective approach" (S053).

Their positive attitudes have encouraged them to try their best to teach the subjects in English. They are also optimistic in their expectation of their students' ability to change with the right and effective approach in teaching. To them teaching the subjects in English language is not a problem as long as the students have interest. They are confident of their ability to teach in English because of their experience with the language. They are positive that students can be guided to follow the lessons according to their ability. With the new approach in teaching and with the relevant teaching aids as well as computers and LCD, they should be able to develop students' interest in the subjects. With proper time management, the teachers feel that they did not experience any serious pressure during teaching. Furthermore the teachers agree and support the newly introduced system in teaching mathematics and science in Malaysian schools.

Factors Contributing to Teachers' Stress

The data from open-ended questions were analyzed qualitatively and it was found at least there were six categories of factors which form the stressors among teachers teaching science and mathematics in English. The factors contributing to teachers' stress are shown in table 2. These factors were derived from statements

made by the teachers regarding the stress that they experienced in teaching the curriculum in English.

Table 2
Factors contributing to Teachers' Stress

Factors	Frequency	Percentage
1. Students' level of acceptance	87	54.0%
2. Management of time and facilities	38	23.6%
3. Teachers' incompetence	36	22.3%
4. Work load	28	17.3%
5. Monitoring by authorized personnel	15	9.3%
6. Students' performance	12	7.4%

Students' level of acceptance

The most frequent factor mentioned by teachers is students' level of acceptance (54%). Teachers worry over their students' ability to understand science and mathematics taught in English. They find it stressful when faced by students who do not pay attention in class when they are teaching. Teachers are also worried when students did not show interest in the subjects due to lack of understanding of the content. The students may have difficulty to understand both mathematics and science especially the weak ones and those who are in the rural or remote schools. Apart from trying to master the content, they also have to understand the language used. Even though they have learnt English as a second language since the beginning of their school days, this is the first year they are learning science and mathematics using the second language.
Examples of statements by teachers are as follows:

> "It is difficult to attract students' interest to learn mathematics" (S010).
>
> "It is difficult for students to understand the subject matter as they lack the basic skills in English" (S061).

The weak students find it difficult to acquire the basic concepts and skills in mathematics and science as they have to learn in English instead of their mother tongue. When they have difficulty in understanding the content, they will not be able to understand or answer the questions planned in each lesson. This will further dampen their interest and finally will affect their performance in the subjects (Zaidatol& Habibah, 2001). Teaching becomes stressful if the students have negative attitudes and start to misbehave and create discipline problems in class. From teachers' observation, the students were not willing to work hard and did not complete their homework or daily excercise. The negative behavior displayed by students made it more difficult for teachers to achieve their instructional objectives. This problem gets worse when students have preconceived ideas that science and mathematics are difficult subjects and they get bored easily when they do not understand the content. In addition, teachers have to handle a large number of students in class with varying abilities and they have a hard time in finding the best approach to impart knowledge to them. The above problems are related to the teaching of the curriculum using English as the medium of instruction.

Management of time and facilities

About 23.6% of the respondents have problems with time management and the handling of facilities. Teachers expressed that they did not have enough time to conduct the teaching and learning activities planned for their classes. They find that there are too many topics for the students to learn within the limited time frame. They find it stressful when they have to cover the syllabus within the time frame especially for the weak students. They could not implement student centred teaching fully because of the time constraint. It is more difficult for teachers to spend more time with the weak students as the time allocated for the lessons is being used for setting up the computers and LCD equipment. Since most of the equipment is new to the teachers, they need to learn and get used to them. In addition, teachers have to prepare quality teaching and learning materials before their classes.

Examples of statements by teachers are as follows:

> "Students centred teaching cannot be implemented fully because of lack of time" (S020).

> "Teachers have to share teaching aids and labs and we do not have enough apparatus for practical work" (S133).

Teachers also expressed their concern over the lack of reference books for the students to refer and lack of teaching materials. For some schools they do not have enough equipment and facilities for the teachers to use for example apparatus for practical classes in the science labs.

An additional responsibility for teachers is the safety of the computers given to them as teaching aids. Teachers feel the stress especially when they have to take the computers home for safekeeping and also for lesson preparation for the following day.

Teacher incompetence

About 22.3% of the teachers in the study expressed their incompetence in the teaching of science and mathematics in English. There are two areas in which teachers have identified as their weaknesses in implementing their teaching. First, they feel that they are not competent in using English as the medium of instruction. The lack of experience in teaching English could be a contributing factor for not feeling confident to use the language. They also feel that they do not have enough English language skills and find it difficult to communicate in the language. The lack of vocabulary added to their worry that they may not be able to explain concepts in mathematics and science to the students. The teachers also agreed that they need a lot of practice before they can teach the subjects. The teachers are not ready to teach the subjects in English because some are not exposed to any courses on teaching mathematics and science in English earlier on. With feelings of incompetence, teachers expressed their lack of confidence to teach the subjects successfully. Their main concern include how to plan lessons most suitable to students' ability and how to make the weak students understand the lesson.

Some examples of teachers' statements:

> "I am worried if my teaching is not effective or not understood by the students" (S043)

"It is difficult to communicate using English" (S060).

The second area of weakness is their lack of competence in handling the equipment used in teaching. Teachers expressed their worry over the handling of the computers and LCD equipment. They have not acquired the skills of using the equipment in teaching and their incompetence may affect their teaching. Their lack of skills in handling the equipment requires more time before they can start teaching and this could contribute to their stress in teaching. For most teachers, this could be their first time using computers as their teaching aids and they need to practice and become familiar with the equipment in order to acquire the skills.

Work load

A considerable number of teachers (17.3%) feel stressful due to the work-load given to them. With the new approach in teaching, teachers have to do the lesson preparation in order to be more effective and to be able to attract students' attention. They need to prepare more questions for monthly tests and examinations. Teachers have to check students' work-books and exercises daily as this will get the attention of the administrators as well as parents. The increase in work-load also include paper work and administrative duties that the teachers are given. This has taken up their free time which could have been used for lesson preparation.

Examples of statements by teachers :

"We have increasing work load in teaching as well as paper work" (S161).

"Teachers are also given administrative duties" (S151).

Apart from that, teachers have to attend many courses from time to time in order for them to be able to implement the new policy changes. Other than teaching load, teachers have to be involved in extra curricular activities after school hours.

Monitoring by authorized personnel

About 9.3% of respondents have expressed concern over the monitoring of their teaching by authorized personnel such as officers from the Education Department or even by the school principal. Some teachers get nervous when they are observed while teaching and this would add to teachers' stress.

Examples of statements by teachers:

"I get nervous when I am observed as I may not achieve the target" (S001).

"There is too frequent monitoring by department officers and the Principal" (S008).

The teachers feel that they are being pressured by the administrators to produce good examination results. They are expected to teach well so that the students will achieve excellent examination results or at least an increase in the percentage of passes at the end of the academic year. The high expectation for students to do well in examination does not only come from the school but also from the society and the parents. What worries the teachers is that the target may not be achieved especially when they have weak and undisciplined students.

Students' performance

A small percentage of teachers (7.4%) are concerned with students' performance. They have to ensure that students' performance reach the target set by the school and the authorities. They are given the responsibility to see that the percentage of passes is always on the rise. The high expectation from the school, parents and higher authorities increase the teachers worry especially those who teach in the rural areas or the weak classes.

Examples of statements by teachers:

> "Teachers have to ensure the students achieve excellence" (S101).
>
> "Teachers have to work hard in order to achieve the target set in students' performance" (S004).

Especially in the first year of its implementation, the teachers find that students with negative attitude, low level of interest, inadequate basic skills in English language, science and mathematics find it difficult to understand the lessons. With such students, teachers have no confidence that the target performance can be achieved.

Discussion

Stress is the physiological and psychological response of an individual to demands, constraints, or opportunities involving uncertainty and important outcomes (Lunenburg and Ornstein, 1996). This study found that work load is one of the factors that contribute to teachers' stress in teaching Math and Science in English language. The findings of this study concur with that of Brine (2002), Johnstone (1989) Zohar (1995), Timperley & Robinson (2000) and Campbell & Neil (1992).

For many teachers , having too much work and not enough time or resources can be stressful. Role overload exists when demands exceed the capacity of a teacher to meet them adequately. Teachers in this group feel stressful because they do not have sufficient time to complete their work. Not being able to do all that they would like to do in the time available is a continuing source of stress (Lunenburg and Ornstein, 1996). Maurer and Davidson (1998) found that members changed more willingly when they believe that change would reduce their work load, accepted the change through consensus and accepted the necessity for change when change was consistent with the school's vision, mission and culture.

Even though the government policy is to implement teaching Mathematics and Science in English, teachers feel stressful because of the students' level of acceptance. This should not be a reason to be stressful because every school may begin with the implementation of instructional programs supported by technology but all the precursors to implementation that planning, purchasing, installation and staff development should happen together (Maurer, 1998). He suggests that the most important question is always to ask how do we want the instructional program to change.

Another factor that contributes to teachers' stress is management of time and facilities. Effective use of instructional technology is based on the ability of technology to support quality instruction. Maurer (1998) argues that systematic teaching and learning will happen only with a concurrent change in the school culture. The movement from traditional knowledge-transmission models to

constructivist learning models is a major restructuring of the vision and mission in an emerging school culture. However Hellriegel, *et. al.* (2001) indicates that cutting-edge technology, while clearly of great benefit to society in general and many individuals in particular, nevertheless has created job conditions that may be quite stressful. In addition, this study found that teachers experienced stress because of the inadequate laboratory facilities and they have to set up computers in ordinary classes to teach mathematics. Time utilized to set up computers and LCD contribute to teachers stress because it reduces their teaching time and consequently the quality of their teaching.

Even though the Malaysian secondary schools are required to meet the new demands of the 21st century such as students need to acquire a new set of skills namely, learning mathematics and science in English and using computer as a tool to acquire new knowledge , teachers find that this policy contribute to their stress. This study concurs the findings of Zaidatol and Habibah (2000) which indicated that teachers are not expert in 'ICT' usage and they suggested that the present government policies on using ICT should try to encourage and allow new practices to develop. Moorhead and Griffin (1995) concluded that too much stress will lead to a decline in performance. It can be translated into poor quality work or a drop in productivity.

Implications and Suggestions

Low level stress among the teachers can enhance job performance but high level stress can be dysfunctional to both the individual's health and organizational performance. School administrators should be able to acknowledge the current factors discussed in this study whether their teachers are really affected by the new changes because the outcomes of stress can be costly to the organization. The analysis of the behavioral effects of job stress may be most helpful to the administrator. As teachers' stress will influence their attitude and motivation towards teaching in English, staff development should be properly planned to overcome problems related to teachers' English proficiency and their ability to handle computers.

Teacher empowerment can be one solution to teachers' stress. For example in an effort to improve teaching, the supervision of instruction should be conducted by teachers among themselves. Teachers may work in pairs on a specific part of the lesson or a specific part of the instructional skills (Sergiovani, 1999). He further suggested that if teachers are to be responsible for teacher improvement, then they should have some say on how resources in the school are to be distributed.

Sergiovani (2001) commented that adopting changes is not the same as implementing changes. Sometimes changes have unanticipated consequences that, when forced on the system, make things worse than they were. The unit of change is not limited to the individual teacher, the school, the work-flow of teaching and schooling and the broader political and administrative context. Instead the four are viewed as interacting units of change which require attention (Sergiovani 2001). When attended properly, these units of change will lead to successful school improvement.

Although stress cannot be completely eliminated from the work environment, it can be managed. Supervision by the school administrators can play an important

role in managing stress and in keeping work-load reasonable for the teachers. Discussion with teachers and utilization of participative management style whereby school administrators work together with teachers will ensure teachers understanding of the implementation of the new policy.

Bibliography

Briner (2002) Research Reports, the SCRE Centre: Feeling the Strain: An Overview of Literature on Teachers Stress, http:www.scre.ac.uk/resreport/rr109/3.html (30th May 2003).

Campbell, R.J. & Neill, S.R. (1992). The Use of Management of Secondary Teachers' Time After the Education Reform Act 1988. Warwick: University of Warwick.

Ferguson, P. (1999). The Inspection of Primary School Factors associated with school development. Unublished Report.

Hellriegel, D., Slocum, J.W. & Woodman, R.W. (2001). Organizational Behavior. South Western College Publishing, Canada.

Johnstone, M. (1989). Stress in Teaching : An overview of research, Edinburgh:SCRE.

Lancero, A.W. & Gerber, R.M. (1995). Comparing work satisfaction in two case management models. Nursing Management, 26(11) : 45-48.

Leiter, M.P. & Maslach, C. (1988). The Impact of interpersonal environment on burnout and organizational commitment. Journal of Organizational Behavior, 9: 297-308.

Lunenburg, F.C. & Ornstein, A.C. (1996). Educational Administration: Concepts and Practices. Wadsworths Publishing Co., London.

Maurer, M.M. & Davidson, G.S. (1998). Leadership in Instructional Technology. Prentice Hall, Ohio.

Moorhead, G., Griffin, R.W. (1995). Organizational Behavior: Managing People and Organizations. Houghton Mifflin Company, Toronto.

Perkins, A.G. (1994). Medical Costs: Saving Money by Reducing Stress. Harvard Business Review. 72(6):12.

Selye, H. (1974). Stress without Distress. Lipincott.

Sergiovanni, T.J., Burlingame, M. , Coombs, F.S. & Thurston, P.W.C. (1999). Educational Governance and administration. Allyn & Bacon, Tokyo.

Sergiovanni, T.J. (2001). The Principalship : a reflective practice perspective. Allyn and Bacon, Tokyo.

Travers, C.J. & Cooper, C.L. (1996). Teachers Under Pressure: Stress in the teaching profession. London: Routledge.

Timperley, H. & Robinson, V.(2000). Workload and the Pro Culture of Teachers. Educational Management and Administration, 28, 1, 47-62.

Troman, G. (1998). Living at a Hundred Miles an Hour: Primary teachers' perceptions of work and stress. Paper presented at the British Educational Research Association Annual Conference, Belfast, August 27-30.

Zaidatol Akmaliah & Habibah Elias (2001). Secondary school teachers perception on the usage of information communication technology (ICT) in enhancing teaching. Proceedings of the International Conference "Education and ICT in the New Millennium", Faculty of Educational Studies, Universiti Putra Malaysia, 343-349.

Zohar, D. (1995). The justice perspective of job-stress. Journal of Organizational Behavior, 16(5) : 487-495.

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