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Teacher attrition: a review of literature☆

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Abstract

Teacher attrition is generally positioned within research addressing teacher shortage, the wastage of resources and expertise, as well as that concerning teachers' lowly status and poor working conditions. As such the research is fragmented and diverse. This paper attempts to draw together contemporary international attrition research in order to consider: how teacher attrition may be defined; patterns of attrition; influences upon attrition; the impact of attrition; and strategies employed for decreasing attrition. It concludes that research concerning teacher attrition requires the development of more comprehensive databases on teaching personnel and increased clarity of how attrition is being framed and investigated.

Keywords: Teacher attrition; Teaching conditions

Recurring patterns of teacher shortages and surpluses have been characteristic of many market-driven economies (Centre for Educational Research and Innovation, 1994). Accommodations to these imbalances have taken the form of teacher un- and under-employment, higher rates of "leakage" to other economic sectors, and recruitment of those who are less qualified or who lack formal qualifications. During the 1990s the pendulum has swung towards a global shortage of qualified teachers particularly within the areas of Science, Mathematics, and Languages. The Organisation for Economic Co-operation and Development (OECD) (1990) attributes this shortage to the ageing of the profession, the difficulty in making long-term matches between demography and teacher numbers, changing patterns of women entering and re-entering teaching, and attractive openings in other occupations/industries when compared with the working conditions of teachers. It is the last trend which contributes to teacher loss or attrition from the profession.

Teacher attrition is frequently positioned as either a problem for work force planning and resources or an indicator of the relatively poor quality of school life and teacher morale. A counterperspective is that teacher attrition is not necessarily a problem in that low levels of teacher attrition may lead to stagnation of the profession and schooling. The following paper primarily addresses teacher attrition as a problem to educational provision in developed and less developed countries. After defining what might be meant by attrition, it presents some statistics on patterns of attrition before reviewing the causes and impact of

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teacher attrition and possible ways in which it might be reduced.

Understanding teacher attrition is particularly important in contexts where economically and socially the costs of attrition are unbearable, teachers are becoming increasingly professionally and geographically mobile, and new management regimes are changing the nature of teachers' work (Hatcher, 1994). Yet, the causes and effects of teacher attrition vary across cultures and socio-economic situations, teachers' ages and specialties, and according to the research methodology employed (Chapman, 1994; Gritz & Theobold, 1996). Thus, the study of attrition is timely yet problematic.

1. Defining the issue

It can be argued that understanding the extent and nature of teacher attrition is clouded by definitional and methodological problems. Documents which focus on educational work force planning, and in particular, the questions of teacher supply and demand, position attrition within the sphere of "wastage" which, in turn, is part of the broader issue of teacher turnover. Wastage differs from turnover in that turnover refers to the annual rate of teachers leaving their particular school position. Therefore, turnover includes wastage together with the lateral movement of teachers within schooling systems.

Wastage can be considered as the number of teachers who leave full-time teaching in the preschool, primary and secondary sectors of education through causes such as death, retirement, resignation, dismissal, temporary withdrawals, and resignation within education (Williams, 1979). The British Department of Education and Science (1990) categorised two forms of wastage in its statistical analysis: (a) premature retirement – those who retire earlier than normal because of efficiency or redundancy measures; and (b) other wastage – all other leavers, including normal retirements and those who choose to leave early. Other scholars have equated "wastage" with attrition, a narrower interpretation referring to the premature and voluntary departure of teachers (e.g. Smithers, 1990).

Even if it can be agreed that in studying attrition the focus of attention should be on those teachers who voluntarily and prematurely leave the profession, further interpretations require clarification (Hammer & Rohr, 1992; Kirby & Grissmer, 1993; Metais, 1991). Firstly, studies should define who they are considering as teachers. Frequently, statistics only include those leavers from full-time employment and ignore shifts in often large, part-time sections of the work force. Secondly, studies should account for teacher mobility. A teacher who resigns from a school system or region should not perhaps be considered a "leaver" in that they might be re-employed in another school sector, educational occupation or country. Thirdly, studies should recognise the importance of differentials associated with attrition across countries, times and groups. As attrition patterns suggest that attrition is highest amongst those who are young, better qualified, living and working in difficult conditions, in particular subject areas and during times of economic prosperity, data on attrition should be context-specific. Fourthly, account should be taken of temporary leaving and therefore attrition statistics should be viewed in conjunction with rates of return to the profession, reported to apply to approximately one-quarter of all leavers.

Just as research on attrition has varied in its attempts to account for the above-mentioned conceptual issues, it has also varied in its methods. Quantitative data reporting rates of teacher loss, replacement, survival, and turnover derived from surveys and/or government statistics dominate the literature. More specifically, attrition rates have been estimated from the proportion of teachers employed in a specific jurisdiction who leave their jobs over a definite period of time. Other research has used extended time frames and multi-year survival rates. While the quantitative research is cost-effective, it has been criticised for its emphasis on the collection of statistics at pre-specified points in time and its lack of account for movement within the profession. In response to this criticism, Willett and Singer (1991) have recommended survival analysis or event history analysis which provides more longitudinal data while other researchers have argued for more in-depth qualitative case studies as

ways to account for the complexities of teachers' career decisions.

While not always explicitly stated, much of the study of attrition is positioned within an individualistic, human capital theory perspective in line with empirical-analytic methods. Theoretically, this suggests that teachers consider monetary (income, promotion, other benefits) and non-monetary (conditions of work such as the physical environment, convenient hours, relationships with co-workers) factors in making career decisions alongside considering the costs involved in undergoing retraining for a new occupation and income foregone during this process. Thus, individuals enter into or change occupations to "maximize net returns, taking into account both benefits and costs" (Arnold et al., 1993 p. 26). In staying in an occupation one often accrues knowledge, skills and contacts that are relevant to that occupation, an investment in that location (e.g. home ownership) and knowledge and/or seniority within a particular institution. It is argued that as these capitals increase, the less likely a teacher is to leave.

An outcome of these definitional and methodological issues is the lack of a cohesive literature on teacher attrition. Globally, the need is recognised for some shared understanding of what is attrition and how it can be studied in ways which account for variables of sex, age, qualifications, ethnicity, location, specialisations, re-entry, economic climate, mobility within teaching, and the like (Forojalla, 1993). Such a database is considered essential if educational planners are to address the broader questions of the extent to which teacher attrition is a problem and how it might be reduced.

2. Patterns of attrition

This section will draw on government reports and empirical research in order to convey the range in patterns of attrition. The reports are generally those prepared by agencies such as UNESCO, the OECD, the International Labour Office (ILO), the World Bank, and the International Bureau of Education (IBE), and are accessible through the libraries of those organisations. Where government reports such as those submitted to the IBE/UNESCO International Conference on Education (1996) raise attrition, the parameters of what is understood by attrition are infrequently articulated and statistics are considered as approximate.

Contemporary teacher attrition rates are reported as varying between 5 and 30%. In a submission to the Commission on Education for the 21st Century, Bottcher (1994) argued that less than 10% of teachers in Germany reach normal retirement age. In Britain the numbers leaving teaching through premature retirement exceed those retiring from the profession at 60 and 65 (Mercer & Evans, 1991). At the other end of the spectrum, an OECD (1996) report on the Czech Republic suggested that 25% of those newly qualified to teach did not even enter the profession. Generally, lower attrition rates exist in developed countries than in less developed countries, during times of economic constraint rather than economic growth, and in urban locations (e.g. Gottelmann-Duret & Hogan, 1996; Gritz & Theobold, 1996). Hammer and Rohr (1992) and Bobbitt et al. (1994) report that about 5.5% of USA public school teachers and 12.5% of private school teachers had prematurely left the profession in the late 1980s and early 1990s. Wagner (1993) argues that this rate of attrition is expected to increase in the USA as the pool of current teachers continues to age and more attractive job opportunities open up. Over a similar period in England and Wales, Smithers (1990) maintained that about 5% of full-time permanent teachers were leaving the profession prematurely. If temporary staff are included the figure is 3% higher (i.e. 7.6%). These figures are similar to the 3–8% attrition from Australian government schools, a reduction of 10% from attrition rates in the early 1970s (Burke, 1989).

Less economically and socially stable countries have reported varying rates which reflect the general trends outlined above. Malawi, with a slow economy, has reported an 8% attrition rate (Mchazime & Siege, 1996), while the economic "freedom" in the Czech Republic and Liberia has contributed to attrition rates of 20% (Czech Republic, 1996) and 20–30% (Chapman, 1994) respectively. Hofmeyr and Jaff (1996) note that the South African 6% average rate of attrition was arrived at by conflating a 3.7% attrition rate amongst the African teaching population with

a 10.7% rate of attrition amongst the "white" teaching population, a reflection perhaps of the available choices.

Rates of attrition are more telling when patterns are mapped with respect to a range of inter-related variables. One key variable is the point in teachers' careers and/or their age when attrition occurs. Literature suggests that attrition rates are highest in the early years of the career when, as described by Huberman (1993), many teachers are moving from survival and discovery to stabilisation and, in their personal life, involved with family-related changes such as marriage and child rearing. Using years of teaching as a framework, Arnold et al. (1993) and the Department of Education and Science (1990), reported that in the first ten years attrition is high; then it becomes relatively low between 10 and 25 years and it increases again late in careers as teachers begin to retire. More specifically, in the USA, Bobbitt et al. (1994) reported that the highest rate of attrition was 18.9% for teachers under 30 years old.

Differentials in attrition between state and private school systems have also been reported. For example, while Bobbitt et al. (1994) confirm higher attrition from USA private schools, where pay conditions may be below state pay awards, Smithers (1990) reports that in England and Wales attrition was lower in the private school system (3.2%). Figures from the Catholic Education Commission of Victoria (Schools Council, 1990) suggest higher than expected rates of attrition from their system with 16.5% of primary and 20% of secondary teachers prematurely leaving their appointments.

Research has also focussed on specific subject areas or specializations. While there is much concern expressed about the shortages of teachers in areas such as the Languages, Science and Mathematics [suggested in 1996 IBE/UNESCO reports from e.g. Australia, Russia, and Yugoslavia, and the International Labour Office (ILO, 1991a) for countries such as Barbados, Cameroon and Nepal], few statistics are available which specifically address the attrition of teachers from these areas. In England and Wales, subject areas which suffer the highest rates of attrition are English, Music, Technology, Physical Education and Science (Department of Education and Science, 1990). In the USA, Bobbitt et al. (1994) claim there is little evidence of differences between subjects although Wagner (1993) disagrees, citing shortages in the Sciences and Mathematics. Research within "marginal" subjects such as Physical Education suggest relatively high rates of attrition with 50% from an Australian cohort (Macdonald, Hutchins & Madden, 1994) and the expressed intention to leave by 80% of male and 40% of female Physical Education teachers in England (Evans & Williams, 1988). Similarly, the stresses associated with work in Special Education in the USA have generated a profile of attrition rates varying from 9 to 24% (e.g. Pyecha & Levine, 1995).

Other variables around which attrition has been mapped include teacher qualifications and location. There is widespread evidence that those younger teachers who are university graduates are more likely to move out of teaching than their counterparts who only have certificates (e.g. Murnane & Olsen, 1989). Many attrition studies in both less developed (e.g. sub-Saharan Africa: Gottelmann-Duret & Hogan, 1996) and developed countries (e.g. Australia: Howse, 1991) also report higher rates in rural areas. In other developed countries such as the USA, Wagner (1993) reports attrition is higher in major cities and schools which have increasing minority enrollments. These statistics may be clouded however by questions of whether they are reporting turnover (which includes moving to other locations but remaining within the profession) and attrition (Gritz & Theobold, 1996).

Some attrition research, primarily conducted in developed countries, has attempted to monitor what teachers do when they leave teaching. Patterns suggest there is a strong possibility that a large proportion of those teachers who leave will return to the profession. In Australia, 50% of a cohort had taken approved leave with a view to returning. Those who left teaching more permanently reported home duties (8% predominantly for women), travel (7.2%), private industry (16.8%) and non-teaching work in education (18%) as their intentions (Schools Council, 1990). These patterns are similar to those reported for the USA (Arnold et al., 1993) although Bobbitt et al. (1994) reported higher rates of home duties (19%) and non-school

occupations (35.8%) amongst teachers who had worked in private schools.

3. Factors which influence attrition

There is an extensive body of literature upon which to draw for a discussion on why teachers leave the profession on the basis that there is a link between the conditions of teaching and teachers' continuation with their work in the occupation. Much of this literature links to teacher stress described by Kyriacou (1989) as the experience of tension, frustration, anxiety, anger, and depression resulting from work. An ILO-UNESCO Joint Committee (1994) reported on an international survey which revealed 25–33% of teachers suffered significantly from stress and they concluded that stress was a major issue for teachers and attrition.

Different frameworks are available to study the factors which influence attrition. These include categorising the conditions of service and the conditions that affect service (Neave, 1992) or describing root causes and enabling factors as suggested by Chapman (1994). The following meta-analysis will use Neave's framework investigating the school-based, technical and material conditions *of service* and the wider, more social or symbolic factors which *affect service*, while recognising that conditions that affect service have repercussions on the conditions of service.

3.1. Conditions that affect service

Socio-economic and political factors underpin the conditions which affect service and, in turn, the conditions of service. In most countries, there is a strong sense that conditions within schooling and those shaping schooling have deteriorated and consequently are causing increasing levels of teacher dissatisfaction and stress, if not attrition. In countries which have experienced severe financial or political crises such as Albania, Ghana and Yemen many teachers moved to start their own businesses or left their countries in order to get work with better conditions (Chapman, 1994; ILO, 1991a; Kloep & Tarifa, 1994). This contrasts attrition patterns in countries experiencing milder economic downturn in that attrition is generally lower during economic recession when employment alternatives for teachers are fewer (Forojalla, 1993). During times of economic growth, data from Australia suggests that occupations associated with business and technology have a greater pull on teachers than does remaining in the profession (National Board of Employment, Education and Training, 1991).

Large-scale shifts in population have also been a significant factor shaping teacher attrition. Where countries experience population growth at times of fiscal constraint, the priority for the employment of teachers puts strain on the school systems to provide adequate resources thereby making the work of teachers more difficult (Chapman, Snyder & Burchfield, 1993). In citing the experiences of many European countries, Neave (1992) spoke of the impact of post-war population growth and the concomitant rise of mass education accompanied by the demystification, and thereby declining status, of teachers' work. However, declining enrolments have also been reported as underpinning attrition in that there are more teachers competing for the same number of promotion positions (Neave, 1992) thus causing frustration at the lack of career advancement.

The perceived decline in the status of teachers is of concern in most countries from the perspective of how teachers are seen by others as well as how they see themselves (Senate Employment, Education and Training References Committee, 1998). While teachers may have high expectations for themselves and their profession, the recognition of teachers' work by communities and governments is poor (Chapman, 1994). In particular, world-wide teachers are affected by the lack of local parental support (Ravindranadham, 1993; Wagner, 1993). This problem has been exacerbated through the pressures of changing social conditions which prevail on schools. While the repercussions of technology, new educational priorities, multi-culturalism and the expanded social roles of schools may vary in their impact across and within countries, many teachers are left feeling unable to cope and less inclined to remain teaching (Gritz & Theobold, 1996; Neave, 1992; Wagner, 1993).

Where recruits have little initial commitment to teaching the attrition problem is further

aggravated. For some, teacher education is a back door to university when few other opportunities for entrance exist due to, for example, high fees for some courses or gender restrictions in "appropriate" career choices (Chapman, 1994). As reported by Ravindranadham (1993, p. 3), in India, if talented people, "happen to join by accident, they quit it at the first opportunity". In other countries, teaching is often a fall back position and is abandoned when the bonded period (or national service commitment) expires or conditions are right to use their skills and experience elsewhere (Thompson, 1995).

Other socio-economic factors that have been attributed to increasing attrition include living conditions, attitudes towards family responsibilities, health, and ethnicity. Feeling comfortable in their teaching location is important to teachers' satisfaction. Teachers tend to leave positions where: living conditions are extremely poor, harsh or overly expensive, or they do not feel comfortable with local ethnicity, customs or language (e.g. Forojalla, 1993; Gottelmann-Duret & Hogan, 1996; Gritz & Theobold, 1996; Smithers, 1990). In both developed and less-developed countries, this pattern of dissatisfaction can center on urban/rural divides. Teachers' ill-health has also become a significant factor in attrition in African countries such as Malawi and Uganda (Gottelmann-Duret & Hogan, 1996; Mchazime & Siege, 1996).

3.2. Conditions of service

Conditions of service impact upon attrition when they fail to be a sufficient incentive for teachers to remain in the profession (Chapman, 1994). Of the key variables which may be used to discuss how the conditions of teachers' service influence attrition, the question of teachers' salaries has attracted most attention. The ILO (1991b) reported a decline in most teachers' relative salaries during the 1980s, with for example, Mexico's falling by 34%. The ILO (1991a, p. 98) argues that low salaries "may be the root cause of brain drain" in some less-developed countries where salaries are too low to support a family and teachers feel it necessary to take a second job.

In developed countries such as USA and Britain, 65 and 89% of teachers respectively cited pay as the primary motivation to leave the profession (Hammer & Rohr, 1992; Wagner, 1993). In a detailed study of pay and turnover in the USA, Gritz and Theobold (1996) reported that all male teachers' and the more experienced female teachers' decision to remain in teaching was most influenced by the comparison of teaching with non-teaching salaries. Kirby and Grissmer (1993) tracked 50,000 teachers from 1965 to 87 to find former teachers did not believe that increases in salary would have made a difference in their decision to leave teaching yet when current Mathematics and Science teachers were asked what factors would encourage them to stay in teaching, over 50% said higher salaries.

The global problems associated with relatively low pay structures are exacerbated by pay scales which fail to reward teachers' throughout their careers with structures which are static and rigid (ILO, 1991a,b; OECD, 1990; Wagner, 1993). From a career perspective there are three main concerns: firstly, if the challenges remain static with little opportunity for ongoing learning and development; secondly, where the rewards and responsibilities of the career do not recognise the development of skills and experience throughout a career; and thirdly, where there is little opportunity to vary the tasks which are to be undertaken (Brown, 1992; Burke, 1996; Hargreaves, 1994; Macdonald, 1995; OECD, 1990; Schools Council, 1990; Smyth & Shacklock, 1998).

Teachers' work, particularly work in developed countries, has also undergone intensification in line with policies purporting to professionalise teaching (Danish National Commission, 1996; Hargreaves, 1994; Neave, 1992; OECD, 1990; Yogev, 1994). Rather than increase teachers' sense of power and commitment, many reported outcomes in Europe, Australia and the USA suggest that teachers have become dissatisfied with burdensome administrative tasks and expectations for curriculum change, while at the same time have a sense of increased levels of accountability, surveillance and role conflict, especially young and beginning teachers (Huberman, 1989; Kushman, 1992; Macdonald, 1995; Neave, 1992; Wagner, 1993). Sources of

frustration for beginning teachers include student management, lesson planning, alienation, isolation, denigration of personal interests and dependence on outside opinion and observation (Gritz & Theobold, 1996; Huberman, 1989; Willett & Singer, 1991). Additionally, where beginning teachers are due to move from probationary to long-term contracts or tenured positions and administrative delays occur teacher attrition results (ILO, 1991a). Also where teacher shortage has been addressed by introducing poorly prepared or qualified teachers into schools, the neophytes are ill-prepared to face the demands of teaching and often become the early leavers (Kemmerer, 1990).

The sub-standard conditions in which many teachers work, generally in less developed countries, also affect retention (Chapman, 1994; Delors, 1996; Kemmerer, 1990). Classrooms in disrepair, poor sanitary facilities, lighting, and furniture, are aggravated by overcrowding and high teacher : student ratios (e.g. 1 : 150 in Malawi, Gottelmann-Duret & Hogan, 1996). Increasing levels of student violence and teaching students with a wide range of learning needs are exacerbating these stressful physical conditions (ILO, 1991a,b; Mercer & Evans, 1991). Across a variety of contexts many teachers report that student misbehaviour and the added responsibilities for teachers associated with dealing with social and family difficulties unduly stresses teachers (Delors, 1996; Kushman, 1992; Mercer & Evans, 1991; Neave, 1992; Willett & Singer, 1991). These frustrations are confounded for teachers working in struggling economies who do not regularly receive their pay (Mchazime & Siege, 1996).

4. Impact of attrition

While most research discusses the effects of attrition in terms of its negative impact on the quality of teaching and schooling, there is some recognition that this may not be the case, that staff stability itself per se is not necessarily good. Stability, it is argued, can engender complacency and limit the possibilities of introducing new materials and approaches to a resistant teaching population thereby curtailing school improvement (Chapman, 1994). Furthermore, it has been argued that attrition from the teaching profession may be good for other sectors of the economy as teachers with sound knowledge and skills move across employment sectors. In Australia a survey of 6500 teachers revealed 28% of males and 22% of females had worked in jobs other than teaching for at least two years (Schools Council, 1990). When this mobile population re-enters teaching there is potentially added vitality and depth in the profession.

More frequently, and globally, the impact of attrition is viewed as an impediment to the educational, social, cultural and economic goals of schools and communities. Discontinuity of staff can be a major inhibitor to the efficacy of schools in promoting student development and attainment. In particular, concern relates to who chooses to leave the profession. Where the leavers are those who are more successful and/or qualified, as reported for example by Rodgers-Jenkinson and Chapman (1990) in Jamaica, the result is a less capable pool of teachers to assume leadership positions (Thompson, 1995). As previously mentioned, teachers with attractive employment alternatives tend to be those in areas such as the Sciences and Technical Education and Languages – areas of the curriculum that are considered a priority in realising the aims of economic adjustment and the promotion of international understanding.

The attrition of younger and more qualified teachers also affects the age profile and morale of those who stay. In accelerating the ageing of the profession, attrition makes it more difficult for older teachers to compete for promotion opportunities, extended responsibilities, and access to long service leave conditions and the like. Also the stayers, more often women, reportedly may develop a sense of failure as they see themselves as an underclass which has few choices (National Board of Employment, Education and Training, 1994a). If attrition exceeds the intake of qualified recruits, these stayers may also find themselves working alongside those who fulfil the role of teacher although they do not have specific qualifications or commitment to the occupation.

Patterns of attrition from particular locations and subject areas generate problems of maldistribution of the teaching service across a region or

country thereby creating pockets of limited or poorer quality educational provisions. However, the less developed countries report more general shortages (e.g. Bangladesh, Indonesia, Pakistan, Zimbabwe). In such countries, there is also the danger of women choosing to leave those areas with difficult working and living conditions thereby decreasing the number of women who constitute the teaching force and, in turn, the opportunity for girls to access women teachers. Nayor (1988) has reported the drop-out of girls from schooling where they cannot access all-girls institutions with women teachers.

Schools and school systems have sought to cope with attrition and associated teacher shortages by: increasing class sizes (e.g. Argentina); lengthening teachers' working hours and increasing their salary proportionally (e.g. Pakistan); introducing a double shift system where teachers and classrooms are used in morning and afternoon shifts (e.g. Ghana); and increasing the number of teachers available through strategies such as accelerated teacher education programmes, national service, recruiting foreign teachers, recruiting those who have left the profession or those who have no teaching qualification (ILO, 1991a,b; Konadu, 1994; Thompson, 1995). An ILO-UNESCO (1994) report suggested, however, that where teacher shortages existed and double shifts were introduced, as occurs in many less developed countries (e.g. Palestinian Territories), there was a strong and negative impact on women teachers in particular.

5. Strategies to decrease attrition

Strategies presented to control or decrease attrition rates are at one level clearly linked to the research on the causes of attrition. Like the causal research, the literature on decreasing attrition includes some empirical data on relationships between incentives and longevity. However, the majority extrapolates solutions from discussions on teacher dissatisfaction and declining teacher status. Some argument is presented for decreasing attrition by focussing on a single factor such as salary increases while other arguments, such as that proffered by the ILO (1991a,b) and Neave (1992), support a comprehensive overhaul of human resources policies which would include the redesign of preservice and inservice education, tenure and job classifications, and career advancement and development, and the revalorisation of the profession. Several suggested strategies target the individual teacher with the modification of their behaviours (e.g. Arnold et al., 1993; Kemmerer, 1990) while others are directed towards the profession and the community more generally (e.g. Murname, 1993; Murnane & Olsen, 1989; Neave, 1992; Schools Council, 1990). Chapman (1994) has argued that as attrition rates decline and reach low levels (i.e. less than 5%), effective intervention is likely to be complex with no single measure, incentive or target effective.

The following discussion of incentives with respect to teacher retention draws on the categories used by Kemmerer (1990): remuneration (salary, allowances, in-kind salary supplements, bonuses, benefits); working conditions; career opportunities; and instructional support. Chapman (1994) considers that strategies can be further classified as high impact/hard to implement; high impact/easy to implement; low impact/hard to implement and low impact/easy to implement. With incentives for reducing teacher attrition often expensive, governments are searching for those which are high impact, non-monetary and easy to implement in times of fiscal constraint (Chapman et al. 1993) and which are suited to the contexts in which their teachers work. It should be noted that Kemmerer's foci exclude discussion of strategies such as the recruitment of only those who have a high initial attraction to the profession and of particular target groups, such as women, who are often stayers within the profession for various socio-economic reasons.

5.1. Remuneration

World-wide, teachers' salaries have been an important factor in the educational debate addressing recruitment, working conditions, and attrition. Teachers' salaries are of particular concern in less developed countries where they account for a large percentage of education spending (e.g. Africa 80%, Latin America 95%) when compared to developed

countries where salaries constitute a lesser proportion (e.g. around 65%) (Oliveira & Farrell, 1993; Psacharopoulos, Valenzuela & Arends, 1993). Institutions such as the ILO (1991b) call for rises in teachers' salaries so that they are commensurate with other professionals with equivalent qualifications. This is supported by Chapman (1994), p. 19) who has argued in his meta analysis that increasing salaries is the "single most direct and effective way to reduce attrition" although not always practical (i.e. high impact but hard to implement) due to fiscal limitations. Certainly, the evidence from those countries in which teachers are relatively well paid and enjoy a high status (e.g. Denmark, Italy, Japan, Germany) would support this strategy (Barro & Lee, 1993; Orivel & Perrot, 1993).

Using a USA population, Murnane and Olsen (1989) demonstrated that beginning teachers who are paid more stay in teaching longer although this pattern of retention varied across subjects specialties (i.e. Physics and Chemistry teachers were still less inclined to stay) and National Teacher Exam scores (i.e. those with higher scores were influenced less by salary increases but also stayed in teaching for shorter durations). Murnane and Olsen recognised that a limitation of their research was that they did not distinguish between teachers who changed occupations and teachers who moved to another state to teach. However, they concluded that an increase of US$1000 per increment resulted in an increase in the median duration of two to three years service. Seven years later, Gritz and Theobold (1996) concluded that a US$3000 increase in salaries was a threshold for discouraging attrition. Other literature (e.g. Conde, 1995; Eilor, 1996; ILO, 1991a,b; Ravindranadham, 1993) argues the positive effect of increased salaries on teacher retention in several countries (e.g. Cuba, Guinea, India, Mauritius, Uganda) although empirical details are scant. Despite the widespread support for salary increases they should also be looked at in relation to how they are structured and distributed over a career (OECD, 1990). The ILO (1991b) warns of the problem of attracting and retaining beginning teachers with higher starting salaries only to have the salaries stagnate by mid-career.

Monetary rewards and incentives to selected teachers on the basis of location, hardship, qualifications, specialist areas, performance and overtime appear to be gaining credence (i.e. potentially higher impact and easier to implement) in developed and less developed countries (Murnane, 1993). Countries such as Chile, Guinea, India, Islamic Republic of Iran, and Sri Lanka employ a variety of allowances for travelling, accommodation, hardship, study leave, special programmes and food (Conde, 1995; Edwards, 1993; Eilor, 1996; ILO, 1991a,b; Kemmerer, 1990; Murnane, 1993). In England and Wales, local authorities have claimed to successfully use monetary incentives for outstanding performance and those teaching in subjects where there are teacher shortages (Metais, 1991) while in Sierra Leone the additional allowances paid to Science and Mathematics teachers have proved barely enough to retain them (Thompson, 1995). Some countries have found it effective to encourage teachers to earn money outside their school, through, for example, private tutoring, while other strategies to boost teacher salaries involve local community funding and rewards (Chapman, 1994). Kirby and Grissmer (1993) argue that differentials in remuneration targeted at particular teaching groups are theoretically and economically strong but require more fully evaluated, pilot programmes matched to local contexts.

In order for these more flexible remuneration arrangements to be successful one line of argument suggests that salaries need to be decoupled from those of other civil servants and determined moreso by free market forces and relativity of incomes (Edwards, 1993; Psacharopoulos et al., 1993; Zymelman & DeStephano, 1993a). In contrast, yet also in order to achieve the objective of retaining teachers, others argue for a more secure civil servant status for teachers such as that which is found in France, Germany and Portgual where teachers have attractive salaries along with security, pensions, and a relatively high social status (ILO, 1991a,b; Oliveira & Farrell, 1993; OECD, 1990). Regardless, educational planners are reminded that market conditions are continually operating and decisions should be made according to the immediate context (Oliveira & Farrell, 1993).

There is little evidence that increased salaries and other monetary allowances alone can have a high and long-term impact on attrition. For example, Eritrea (Eritrean Ministry of Education, 1995) granted a 40% increase in some allowances but teachers still continued to leave difficult areas. In addition, there is reportedly widespread negative effects on the profession generally where incentives such as merit pay have been introduced (e.g. Australia: Smyth, 1998). Not only has it caused divisiveness but its foundations are shakey given that it is difficult to effectively define the behaviours which are being rewarded (Chapman, 1994; Murnane, 1993; Oliveira & Farrell, 1993).

5.2. *Working conditions*

In addressing working conditions, schools and school systems have sought to protect and/or improve the physical, social and professional dimensions of teaching together with enhancing teachers' living standards and relationships with the community. Some conditions which may need to be protected, such as a relatively shorter working day, are particularly important for women who may have to consider family commitments (Huberman, 1993; Oliveira & Farrell, 1993). For other teachers, improved working conditions may off-set relatively poor salaries (Oliveira & Farrell, 1993).

There are a myriad of strategies available to schools and school systems which might take the form of benefits to compensate and/or reward teachers over and above their salary. These strategies include:

- repairing and upgrading school buildings and teachers' accommodation,
- increased teacher responsibility for educational decisions,
- prioritizing student learning and cooperative behaviours,
- reducing class sizes,
- increased parental and community support for schools,
- child care provisions,
- collegial relationships amongst teacher and with administrators,
- teacher support and recognition,
- counselling and medical care.

(CERI, 1994; Delors, 1996; Huberman, 1993; ILO, 1991a,b; National Board of Employment, Education & Training, 1994a; Rodgers-Jenkinson & Chapman, 1990; Rosenholtz, 1989; Smith & Bourke, 1992; Wagner, 1993). Kushman (1992) and Friedman (1991) argue that where favorable conditions exist, such as those listed above, teachers' organizational commitment is increased and attrition is reduced. Although they involve some cost, Rodgers-Jenkinson and Chapman (1990) argue that strategies directed towards working conditions are frequently less expensive than the costs of teacher dissatisfaction, loss, and retraining.

The issue of teacher's power and responsibility has attracted particular attention more recently in line with what has been described as the intensification and proletarianization (disempowerment) of teachers' work (Delors, 1996; Hargreaves, 1994; ILO, 1991b; Neave, 1992; Perrenoud, 1996). Ethnographic studies in developed and developing countries have shown that teachers need to be released from burdensome administrative tasks and have more time and responsibility for teaching (Friedman, 1991; Ginsburg, 1988; Kloep & Tarifa, 1994; Macdonald, 1995; National Board of Education, Finland, 1996; Wagner, 1993). While the decentralising tendencies in many capitalist economies at one level increase "professional freedom" of teachers and schools to meet student needs (Kruszewski, 1994; Smyth & Shacklock, 1998), this "freedom" has also been criticised as superficial and illusive (e.g. Ozga, 1995). Alternatively, some countries have recognised the intensification of teachers' work (e.g. Denmark, Portugal) and have reduced the teaching load accordingly (Metais, 1991).

A good deal of attention has been directed towards different aspects of teacher placement and, in turn, policies for appointment and transfer. In general, there is argument for teachers being better matched to their school appointment by taking into account the teachers' sex, age, teaching interests, and cultural and socio-economic background (Chapman, 1994; Delors, 1996; National Board of Employment, Education & Training, 1994a). With

respect to beginning teachers, it is suggested that they be placed as soon as possible after graduation (Wise, Darling-Hammond & Berry, 1987) and in familiar and supportive environments (Rosenholtz, 1989). Furthermore, there is support for the appointment and transfer process to be more collaborative between teachers, systems and across countries (Conde, 1995; Neave, 1992; Thompson, 1995) and flexible so that, for example, women with families are not forced to leave the profession due to inappropriate placements (Gottelmann-Duret & Hogan, 1996; Konadu, 1994). Gottelmann-Duret and Hogan (1996) also maintain the importance of placing teachers to ensure a balanced staff in terms of age, sex and expertise and thereby restore discipline, academic performance and teacher satisfaction. However, there is also a proven role in the reduction of attrition in developed countries for individual support to teachers nearing burn-out through access to counselling and special leave arrangements (ILO/UNESCO, 1994; Kyriacou, 1989).

5.3. Career opportunities and instructional support

This final section introduces strategies which, as described by National Board of Employment, Education and Training (1994b), seek to arrest attrition by emphasising teachers as lifelong learners through improved career structures, opportunities for advancement and inservice education and support. Several countries' IBE/UNESCO reports (e.g. the Czech Republic, Phillipines, Netherlands) mentioned that overcoming flat and narrow career structures was a priority in retaining teachers' interest.

Flexible career pathways whereby teachers are not expected to work full-time, all years, continuously to retirement with the one job description, are claimed to enhance teachers' satisfaction, learning and advancement (ILO, 1991a,b; OECD, 1990). Options available to teachers might include balancing work within the classroom with terms in administration, curriculum projects, supervision of teachers and para-professionals, or employment outside education, although there is concern in less developed countries that attrition may be exacerbated by sending teachers to cities for qualifications and experience (Delors, 1996; Oliveira & Farrell, 1993; OECD, 1990). Flexibility might also include job-sharing and team-teaching (Wagner, 1993). With such flexibility and varied responsibility should come different career profiles which in turn need to be recognised and rewarded (CERI, 1994). While these proposals appear theoretically strong, as previously mentioned, the issue of rewards in financially strapped economies remains problematic and unresolved.

Access to quality pre-service education which provides teachers with a sound platform of knowledge and skills, followed by ongoing access to quality in-service education, are also seen as essential to establishing and retaining teachers' interest and effectiveness (Chapman, 1994). Minimally, in-service education should assist teachers to cope with the changes in technology, students' needs, and curriculum renewal (Delors, 1996). The quality of in-service programmes can be enhanced by establishing links with local universities and teacher education institutions, and establishing local teacher centres, peer support networks, and community associations (Chapman, 1994; Delors, 1996; Oliveira & Farrell, 1993; Thompson, 1995). Chapman (1994) nevertheless warns that teachers can use in-service education as a springboard into other employment and thus it may be unduly costly for education systems. It should also be noted that without access to sufficient instructional materials associated with renewal of teachers' knowledge and student learning, in-service education remains impotent (Chapman, 1994; Oliveira & Farrell, 1993; Thompson, 1995).

While in-service education may be supported as desirable in terms of innovative practices and morale (CERI, 1994; Schools Council, 1991), it also returns us to the question of recognition of professional development through ongoing appraisal and rewards (CERI, 1994). It could be that access to professional development without systemic recognition might further alienate teachers. Literature suggests that teachers are clearly looking for more steps and pathways on career ladders, with increasing and differentiated responsibilities, and having those steps spread across an entire career, from recruitment to retirement (CERI, 1994; OECD, 1996).

6. Conclusion

Teacher attrition is positioned within a range of discourses addressing teacher shortage, the wastage of resources and loss of expertise, as well as those concerning teachers' lowly status, poor working conditions, and dissatisfaction. Accordingly, most literature approaches attrition as a problem for education systems although an occasional voice argues that attrition can be the result of an effective education system which fuels a vibrant economy which in turn offers alternative employment to teachers (e.g. Chapman, 1994). From the latter perspective, attrition might also be seen as a conduit through which the teaching profession is revitalised with educational innovation and new recruits.

It has been possible to profile a range of attrition statistics although their comparability is doubtful. Infrequently, attrition statistics are accompanied by definitions of attrition and how data have been collected and analysed. Furthermore, *who* counts as teachers (those who have no qualifications? part-time teachers?) requires clarification. Where data collection methods have been described they frequently rely on a snapshot of who has and has not remained in the profession at a particular point in time. Willett and Singer (1991) argue that such data is limited and the question of attrition better addressed using a survival analysis approach.

With socio-economic pressures for better resource planning, there are frequent and urgent calls for more rigorous and widespread databases on teaching personnel. Such a database should include a record of the number, types and location of jobs teachers occupy, the sex, age, qualifications, and cost of each teacher in a position, employees' teaching preferences, where teachers move from and to, how long teachers leave the profession and importantly track these statistics across time (Conde, 1995; Gottelmann-Duret & Hogan, 1996; OECD, 1990; Schools Council, 1991; Zymelman & DeStephano, 1993a,b). Through gathering these data, education systems will move some way towards establishing a correlation between teaching conditions and attrition (Kirby & Grissmer, 1993; Wagner, 1993), a relationship currently based largely upon supposition.

A number of strategies have been suggested to reduce the "problem" of attrition. Most frequently, and across varying socio-economic contexts, remuneration has attracted attention as a primary incentive to contain or decrease attrition together with attracting quality candidates into the teaching profession. Remuneration has been closely linked to the somewhat elusive notion of increasing the *status* of the teaching *profession* which occupies a central, yet to date ill-defined, place in the attrition debate (Senate Employment, Education and Training References Committee, 1998). Despite the focus on remuneration, there is also a strong line of argument that single focus strategies seldom work (Chapman, 1994). Yet, to simultaneously raise, for example, teachers' salaries and working conditions is complex and may be more costly than the impact of attrition. Rather, effective strategies must be seen as part of socio-economic reform and a corollary to social and economic reforms. Therefore each country should appraise its own target attrition rate, high impact and realistic strategies, and review these regularly in line with changing conditions (Chapman et al., 1993). Failure to do so jeopardises attracting and retaining well-qualified and motivated teachers, and thereby puts generations of school children at risk.

References

Arnold, C. L., et al. (1993). *Modeling teacher supply and demand, Schools and staffing survey*. Berkeley, CA: MPR Associates.

Barro, S. M., & Lee, J. W. (1993). A comparison of teachers' salaries in Japan and the United States. In J. Oliveira, & J. Farrell, *Teachers in developing countries: Improving effectiveness and managing costs* (pp. 97–112). Washington: The World Bank.

Bobbitt, S. A., et al. (1994). *Characteristics of stayers, movers, and leavers: Results from the teacher follow-up survey: 1991–1992*. Washington, DC: National Center for Education Statistics.

Bottcher, W. (1994). *The role of teachers and the reform of education*. Paper presented at the fourth session of the International Commission on Education for the Twenty-first Century, Vancouver, 13–15 April.

Brown, H. O. (1992). Professionalization and expert knowledge. In D. M. Chincotta, *Professionalization and education* (pp. 57–67). Faculty of Education, University of Hong Kong.

Burke, A. (1996). Professionalism: Its relevance for teachers and teacher educators in developing countries. *Prospects*, *26*(3), 531–542.

Burke, G. (1989). *Teacher supply and teacher quality in Australia: Social and economic aspects*. Canberra: Department of Employment, Education and Training.

Centre for Educational Research and Innovation (CERI) (1994). *Quality in teaching*. Paris: OECD.

Chapman, D. W. (1994). *Reducing teacher absenteeism and attrition: Cause, consequences and responses*. Paris: UNESCO, Institute for Education Planning.

Chapman, D. W., Snyder, C. W., & Burchfield, S. A. (1993). Teacher incentives in the third world. *Teaching and Teacher Education*, *9*(3), 301–316.

Conde, A. (1995). *The redeployment of teachers in Guinea*. Paris: Association for the Development for African Education.

Delors, J. (1996). *Learning: The treasure within. Report to UNESCO of the International Commission on Education for the Twenty-first Century*. Paris: UNESCO.

Department of Education and Science (1990). *Projecting the supply and demand of teachers: A technical description*. London: Department of Education and Science.

Edwards, A. C. (1993). Teacher compensation in developing countries. In J. Oliveira, & J. Farrell, *Teachers in developing countries: Improving effectiveness and managing costs* (pp. 53–66). Washington: The World Bank.

Eilor, J. (1996). *The deployment and amangement of primary teachers in Uganda*. Paris: UNESCO International Institute for Educational Planning.

Evans, J., & Williams, T. (1988). Moving up and getting out: The classes, gendered career opportunities of physical education teachers. In T. Templin, & P. Schempp, *Socialization in physical education: Learning to teach* (pp. 235–249). Indianapolis: Benchmark Press.

Forojalla, S. B. (1993). *Educational planning for development*. New York: St. Martin's Press.

Friedman, I. A. (1991). High- and low-burnout schools: School culture aspects of teacher burnout. *Journal of Educational Research*, *84*(6), 325–333.

Ginsburg, M. B. (1988). Educators as workers and political actors in Britain and North America. *British Journal of Sociology of Education*, *9*(3), 359–367.

Gottelmann-Duret, G., & Hogan, J. (1996). The utilization, deployment and amangement of primary teachers in Africa south of the Sahara. *Prospects*, *26*(3), 559–573.

Gritz, R. M., & Theobold, N. D. (1996). The effects of school district spending priorities on length of stay in teaching. *Journal of Human Resources*, *31*(3), 477–512.

Hammer, C. H., & Rohr, C. L. (1992). *Teacher attrition and migration. Issue brief*. Washington, DC: National Center for Education Statistics.

Hargreaves, A. (1994). *Changing teachers, changing times*. London: Cassell.

Hatcher, R. (1994). Market relationships and the management of teachers. *British Journal of Sociology of Education*, *15*(1), 41–61.

Hofmeyr, J., & Jaff, R. (1996). *Managing the deployment and utilisation of teacers: South Africa in transition*. Paris: UNESCO International Institute for Educational Planning.

Howse, G. (1991). Age and the teaching career. In R. Maclean, & P. McKenzie, *Australian teachers' careers* (pp. 159–185). Melbourne, Victoria: Australian Council for Educational Research.

Huberman, M. (1989). The professional life cycle of teachers. *Teachers College Record*, *91*(1), 31–57.

Huberman, M. (1993). *The lives of teachers*. London: Cassell.

International Labour Office (1991a). *Teachers in developing countries: a survey of employment conditions*. Geneva: ILO.

International Labour Office (1991b). *Teachers: Challenges of the 1990s*. Geneva: ILO.

ILO/UNESCO Joint Committee of Experts on the Application of the Recommendation Concerning the Status of Teachers (1994). Report, Geneva, July 12–20.

Kemmerer, F. (1990). An integrated approach to primary teacher incentives. In D. W. Chapman, & C. A. Carrier, *Improving educational quality: A global perspective* (pp. 136–152). Greenwood Press: London.

Kirby, S. N., & Grissmer, D. W. (1993). *Teacher attrition: Theory, evidence, and suggested policy options*. Paper presented at the Seminar of the World Bank/Harvard Institute for International Development on "Policies Affecting Learning Outcomes through Impacts on Teachers", Cambridge, MA.

Kloep, M., & Tarifa, F. (1994). Working conditions, work style, and job satisfaction among Albanian teachers. *International Review of Education*, *40*(2), 159–172.

Konadu, D. A. (1994). *Improving the deployment of teachers: The Ghanaian experience*. Paris: UNESCO, Institute for Education Planning.

Kruszewski, K. (1994). Reform in Polish education. In V. Rust, *Educational reform in international perspective* (pp. 205–228). Middlesex: JAI Press.

Kushman, J. W. (1992). The organizational dynamics of teacher workplace commitment: A study of urban elementary and middle schools. *Educational Administration Quarterly*, *28*(1), 5–42.

Kyriacou, C. (1989). Teacher stress and burnout: an international review. In C. Riches, & C. Morgan, *Human Resource Management in Education* (pp. 60–68). Milton Keynes: Open University Press.

Macdonald, D. (1995). The role of proletarianization in physical education teacher attrition. *Research Quarterly for Exercise and Sport*, *66*(2), 129–141.

Macdonald, D., Hutchins, C., & Madden, J. (1994). To leave or not to leave: Health and physical education teachers' career choices. *The Australian Council for Health, Physical Education and Recreation Healthy Lifestyles Journal*, *41*(3), 19–23.

Mchazime, H., & Siege, H. (1996). *Country monograph on the management of teacher deployment in Malawi (draft)*. Paris: UNESCO, Institute for Education Planning.

Mercer, D., & Evans, B. (1991). Professional myopia: Job satisfaction and the management of teachers. *School organisation*, *11*(3), 291–301.

Metais, J. (1991). *Teacher mobility in the European Community: Recruitment and management issues*. Brussels: European Unit of EURYDICE.

Ministry of Education (1995). *Basic education: Major issues and problems*. Eritrea: Ministry of Education.

Murnane, R. (1993). Economic incentives to imporve teaching. In J. Oliveira, & J. Farrell, *Teachers in developing countries: Improving effectiveness and managing costs* (pp. 137–144). Washington: The World Bank.

Murnane, R. J., & Olsen, R. (1989). The effects of salaries and opportunity costs on length of stay in teaching: evidence from North Carolina. *Journal of Human Resources*, *25*(1), 106–124.

National Board of Employment, Education and Training (1991). *Student images of teaching: Factors affecting recruitment*. Canberra: Australian Government Publishing Service.

National Board of Employment, Education and Training (1994a). *Women in the teaching profession*. Canberra: Australian Government Publishing Service.

National Board of Employment, Education and Training (1994b). *Workplace learning in the professional development of teachers*. Canberra: Australian Government Publishing Service.

Nayor, U. (1988). *Women teachers in south Asia: Crises, discontinuities and change*. Delhi: Chanakya Publications.

Neave, G. (1992). *The teaching nation: prospects for teachers in the European Community*. Oxford: Pergamon Press.

OECD (1990). *The teacher today*. Paris: OECD.

OECD (1996). *Reviews of national policies for education: Czech Republic*. Paris: OECD.

Oliveira, J., & Farrell, J. (1993). Teacher costs and teacher effectiveness in developing countries. In J. Oliveira, & J. Farrell, *Teachers in developing countries: Improving effectiveness and managing costs* (pp. 7–24). Washington: The World Bank.

Orivel, F., & Perrot, J. (1993). Influences on the choice of a teaching career: an analysis rom an international perspective of the French experience. In J. Oliveira, & J. Farrell, *Teachers in developing countries: Improving effectiveness and managing costs* (pp. 76–74). Washington: The World Bank.

Ozga, J. (1995). Deskilling a profession: professionalism, depreofessionalisation and the new managerialism. In H. Busher & R. Saran, *Managing teachers as professionals in schools* (pp. 21–38). London: Kogan Page.

Perrenoud, P. (1996). The teaching profession between proletarianization and professionalization: Two models of change. *Prospects*, *26*(3), 509–529.

Psacharopoulos, G., Valenzuela, J., & Arends, M. (1993). *Teachers' salaries in Latin America: A comparative analysis*. Washington: World Bank.

Pyecha, J., & Levine, R. (1995). The attrition picture: Lessons from three research projects. Washington, DC: National Dissemination Forum on Issues Relating to Special Education Teacher Satisfaction, Retention and Attrition.

Ravindranadham, S. (1993). *A comparative study of the social status of secondary school teachers working in government schools*. New Delhi: National Institute of Educational Planning and Administration.

Rodgers-Jenkinson, F., & Chapman, D. W. (1990). Job satisfaction of Jamaican elementary teachers. *International Review of Education*, *36*(3), 299–313.

Rosenholtz, S. J. (1989). Workplace conditions that affect teacher quality and commitment: Implications for teacher induction programs. *The Elementary School Journal*, *89*(4), 421–439.

Schools Council (1990). *Australia's teachers: An agenda for the next decade*. Canberra: National Board for Employment, Education and Training.

Senate Employment, Education and Training References Committee (1998). *A class act: Inquiry into the status of the teaching profession*. Canberra: Senate Printing Unit.

Smith, M., & Bourke, S. (1992). Teacher stress: Examining a model based on context, workload, and satisfaction. *Teaching and Teacher Education*, *8*(1), 31–46.

Smithers, A. (1990). *Teacher loss*. Manchester: University of Manchester, Leverhulme Trust.

Smyth, J., & Shacklock, G. (1998). *Re-making teaching*. London: Routledge.

Thompson, A. R. (1995). *The utilization and professional development of teachers: issues and strategies*. Paris: UNESCO, Institute for Education Planning.

Wagner, A. (1993). Social and economic aspects of teaching in the United States. In J. Oliveira, & J. Farrell, *Teachers in developing countries: improving effectiveness and managing costs* (pp. 75–96). Washington: The World Bank.

Willett, J. B., & Singer, J. D. (1991). From whether to when: New methods for studying student dropout and teacher attrition. *Review of Educational Research*, *61*(4), 407–450.

Williams, P. (1979). *Planning teacher demand and supply*. Paris: UNESCO, Institute for Education Planning.

Wise, A., Darling-Hammond, L., & Berry, B. (1987). *Effective teacher selection: From recruitment to retention*. Santa Monica: Rand.

Yogev, A. (1994). The spirit of capitalism and school reform in America. In V. Rust, *Educational reform in international perspective* (pp. 151–164). Middlesex: JAI Press.

Zymelman, M., & DeStefano, J. (1993a). Factors affecting teachers' salaries. In J. Oliveira & J. Farrell, *Teachers in developing countries: improving effectiveness and managing costs* (pp. 43–52). Washington, The World Bank.

Zymelman, M., & DeStefano, J. (1993b). Primary school teachers' salaries in sub-Saharan Africa. In J. Oliveira & J. Farrell, *Teachers in developing countries: improving effectiveness and managing costs* (pp. 113–136). Washington: The World Bank.