Improving Learning in Secondary Schools

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Conditions for Successful Provision and Uptake of Classroom Assessment Feedback

By

Kenneth Ndifor Tangie

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To mummy Nge and teachers of her kind,
Moulders of society and of questive minds,
Sincere, dedicated, ever true in giving the mark.

Yet, comparing sacrifices with benefits fed back,
Heave a sigh not of satisfaction and relief,
But of anger, disappointment and disbelief.

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PREFACE

Students need to be told whether or not they are doing well in their work and conduct at school, to be able to correct misconceptions and omissions that can render them incapable of making progress and learning in a given subject. This book reports a doctoral research that examined teachers' feedback practice (i.e. ways in which teachers provide assessment feedback and various forms of feedback they deploy) and how it promotes and does not promote student learning in three secondary schools drawn from English-speaking Cameroon.

The concept of feedback is approached in this book from a socio-cultural perspective. Feedback, like formal and informal instruction and assessment, is not mediated in vacuo; it is a social process taking place in a social setting, conducted by, on and for social actors. In one way or another, aspects of this setting are bound to affect the way feedback is construed and deployed and how students make use of it. The main research question the study attempted to answer, then, is what the relationship between feedback and learning is in the linguistic and socio-cultural contexts of the classrooms studied.

To investigate this question, I observed how teachers deployed feedback orally during English, Geography and Chemistry lessons. I also collected samples of assessed written work e.g. tests and exercises for written feedback and interviewed teachers and students so as to determine whether what teachers say they do in class and what students think their teachers do, reflect what teachers were observed to be doing. Qualitative and quantitative analyses of data revealed that the way teachers conceptualise and operationalise feedback in the schools studied takes no account of student learning. Teachers were found to be making predominant use of 'positive' and 'negative' feedback relating to affective and social learning, and less use of 'neutral' feedback with potential to promote cognitive skill development. Also, several aspects of the research setting, notably, Government policy on Pidgin English and corporal punishment work against successful feedback provision, uptake and learning.

To date, while the literature on how feedback influences learning is extensive, empirical research into conditions under which feedback promotes learning have, by comparison, received sparse attention. A major contribution the current study claims to make to knowledge and understanding of how feedback works in classrooms is that feedback is construed, mediated and received as part of a socio-cultural process that determines its very existence and meaning. Therefore, the feedback-learning relationship cannot be usefully conceptualised without due consideration given to the linguistic and socio-cultural contexts in which both feedback and learning operate.

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It may take one to dream of success, but it takes many to realise it. The present book would be a far away treasure but for immense assistance and cooperation from many, some of whom I must commend. I am particularly indebted to Dr Edith Esch of Cambridge University for demonstrated commitment, interest, encouragement and intellectual support from conception to operationalisation of this work, and for standing close by when my spirits were low. I am also thankful to Dr Ivo Tambo formerly of the Faculty of Education, University of Buea for advice on dealing with practicability difficulties I faced while collecting research data in Cameroon.

I am indebted to my lecturers at the Cambridge University School of Education for untiring efforts at pointing the path to inquiry, to Professors Donald McIntyre, Malcolm Benson and Loreto Todd for providing helpful suggestions and/or readings respectively on teacher training, corporal punishment and the transcription of Cameroon Pidgin English. I hope they find in this piece reassurance that their help was timely and duly valued.

My gratitude also goes to research participants and other resource persons in Cameroon who provided invaluable information without which my research would never have progressed beyond foundation level. I am thinking particularly of school heads and their deputies in the Private School of Arts & Science Tiko, John the Baptist Secondary School Buea and Government High School Molyko, Buea.

I am most grateful to the following: UK Commonwealth Scholarship Commission, Faculty of Education Graduate Finance Committee, Gilchrist Educational Trust, Board of Graduate Studies Research Awards Committee, Sir Ernest Cassell Educational Trust and Africa Educational Trust for financial assistance provided towards the realisation of this project.

Finally, I acknowledge moral support and encouragement from my entire family, particularly from my wife, parents, brothers and sisters.

LIST OF ABBREVIATIONS

1. MINEDUC Ministere de l'Education Nationale (Ministry of National Education)
2. DELEDUC Délégation de l'Education Nationale (Provincial Delegation of National Education)
3. CP Corporal Punishment
4. PE Pidgin English
5. SE Standard English
6. PPI Provincial Pedagogic Inspectors
7. SNAES Syndicat National des Enseignants du Secondaire (Secondary Teachers' Trade Union)
8. PCAS Private College of Arts and Science
9. JBSS John the Baptist Secondary School
10. GHS Government High School
11. ST Standardised test
12. TFBOS Teacher Feedback Behaviour Observation Schedule
13. NCC National Curriculum Council
14. GCE General Certificate of Education
15. GCSE General Certificate of Secondary Education
16. DfES Department for Education and Skills
17. CPE Common Promotion Examination

CHAPTER ONE

PROLEGOMENA: SETTING THE SCENE

1.0 Introduction

> *'How can either teachers or pupils proceed without checking that… learning is effective, and gaining the immediate feedback that is essential to correct misconceptions and omissions which can render a pupil incapable of proceeding in the later stages of the subject? To teach without assessment feedback is to travel blind' (Black, 1995:269).*

On several occasions in our daily life, we make value judgements about how satisfactorily or not we think something has been done, for example, how well a motorist drives on the highway. In this case we use our discretion and, at times, known pre-established criteria to assess and comment on the motorist's skill and the opinions we give can influence the way the motorist performs the activity on a future occasion. Teachers in classrooms do the same thing: they are frequently expected to assess students' work and conduct and to provide them with feedback which, in diverse ways, can determine further actions they take in view of improvement. This book reports a doctoral study which examined teachers' feedback practice (taken, generally, as ways in which teachers deploy feedback and, specifically, as various forms of feedback they deploy) and how it promotes or does not promote students' learning in three secondary schools in Cameroon. It is important to understand at the outset how the concepts of feedback and learning were used in the study.

The term 'feedback' denotes:

- Information or statements of opinion about the quality of something e.g. an aspect of conduct, a piece of writing, an oral response to a question, etc based on subjective judgements regarding its acceptability e.g. 'Your response is sketchy';

- Follow-up action (s) taken by the provider of feedback towards the recipient in respect of the evaluative judgement e.g. praise following good performance, rebuke or punishment following poor conduct, or requests for retrial following inadequate academic contributions students make (as in 'Add more flesh to the response'). Joyce et al (2000:8) refer to these two dimensions of feedback respectively as 'primary' and 'secondary' feedback.

I claim the right to use the term 'feedback' to designate that and only that which is yielded by the definition I give it in this book, without being obliged to deal with all the problems directly or indirectly evoked by the concept and by any other meanings it may have. Learning can be defined as the acquisition of skills, knowledge, understandings or attitudes through instruction, training, experience and observation which enable a change in the learner (Gagné, 1977; Cullingford, 1990). This change can be seen through: development in students' cognitive ability necessary for the accomplishment of academic/ intellectual tasks e.g. high order thinking, problem-solving, etc; development of affective attributes e.g. interest, motivation, etc required for student engagement, commitment and effort in the learning process; acquisition of norms of conduct and citizenship in school and the wider society e.g. the need for punctuality in class attendance, keeping quiet when the teacher and other students are talking, also referred to as 'social learning' (Gagné, op.cit.).

Though cognitive, affective and social learning are recognised as important for students' education, feedback forms that relate to cognitive growth are considered of special significance for them. Hence, the contribution a particular feedback type makes to learning as presented and analysed in this book will be determined, above everything else, by its capacity to promote cognitive skill development in students and to:

- bring about a relatively permanent change in their behaviour. This is only possible when feedback enables what Black & Wiliam (1998a) refer to as 'deep' learning as opposed to 'surface' learning. Deep learning involves understanding and prolonged, not short-term, grasp of subject matter;
- enable problem-solving in situations other than the ones in which feedback is given and taken up. This involves transfer of knowledge to extra-classroom contexts and is a key issue because it indicates that deep learning has occurred. (Crooks, 1988);

- help students make improvements in their work and develop the skills necessary for this.

In principle, it is possible for teachers' feedback to meet all three criteria for cognitive learning but practice in some teaching and learning environments is a lot more complicated. This is because a lot of tensions and controversies surround the way feedback and learning operate in classrooms, making it difficult for one to conceptualise a one-to-one link between the two. Some of these are discussed below.

1.1 Conceptualisation: feedback, learning and context

1.1.1 Conceptualising the feedback – learning relationship: issues, tensions and controversies

According to Butt (2010:84), 'effective feedback is highly situational; it depends on the context in which it is given. More importantly, it depends on the students themselves–are they ready to receive it, understand and trust what is being said? Are they empowered and motivated to act on this information?' In an ideal classroom situation devoid of any obstacles to successful teaching and learning, the relationship between feedback and learning can qualitatively be hypothesised and explained in very simple terms. For instance, after assessing the quality of students' work and conduct, a teacher *can* carry out a number of activities to help students use assessment results and improve on their performance and learning. He/she *can* make students know their level of performance, what the expected target to be attained is, and what they should do to get there. Students *can* now take appropriate measures to see that they improve on the quality of their work and conduct. However, the experience of feedback and learning in classrooms is not so straightforward for a number of reasons.

Firstly, Ramaprasad (1983:4) has complained about the 'lack of a commonly accepted definition of the concept of feedback' across disciplines[1] since

[1] Ramaprasad himself considers feedback in management theory, as 'information about the gap between the actual level and the reference level of a system parameter, which is used to alter the gap in some way'. According to Walklin's (1991:158) explanation, it applies in industrial contexts, to linking a system's (i.e. a machine's) output to its inputs, thereby monitoring what is going on and keeping the system under control. Kluger & DeNisi (1996:225) from an educational psychological perspective, define feedback interventions as actions taken by (an) external agent (s) to provide information regarding some aspect (s) of one's task

researchers use it to mean slightly different things. The implication he draws is that cross-disciplinary exchange and understanding of academic-related information on the subject will be difficult to achieve. Even within a given discipline e.g. education, professionals and novices with varying levels of knowledge and experience may differ in their understanding of what feedback is, what its purposes and intentions are and what reactions it is intended to provoke from those who receive it. If a teacher deployed a given feedback form and intended for his students to use it for the purpose of learning, no such learning would occur if the students did not recognise the feedback given to them in the first place.

If students do not act on feedback because they do not receive it, then such feedback is of low effectiveness or even ineffective. As Perrenoud claims, communication theory tells us that the effectiveness of a message is measured at the level of the recipient. There is no point sending messages if they are treated as noise rather than as intelligible or pertinent information liable to help the recipient learn. By not receiving feedback, students may not get further knowledge or understanding about the task on which performance was assessed, no information that can convert into better or different strategies for learning and, as a result, are less likely to improve on their performance and learning.

In addition, the forms of feedback teachers make use of can have different, and sometimes, conflicting outcomes that affect students' learning in different ways. While warning, criticism and punishment may cause one student to learn appropriate modes of behaviour or to increase his/her effort and motivation in studies, they may cause another student to rebel and abandon learning tasks out of frustration and resentment for the teacher. Therefore, the way feedback relates to learning depends, crucially, on certain personal characteristics of the learner, all of which no one teacher can claim to master in order to provide feedback satisfactorily or to predict exactly how students will respond to feedback he/she provides.

Further, there is evidence (Bennett et al, 1984) that the ideological stance a society has about how learning is achieved determines the orientation pedagogical practices take in schools, especially instructional techniques

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performance. They add that this definition is similar but not limited to the notion of 'knowledge of results'. As far as teaching and learning are concerned, multiple definitions of feedback can create confusion in teachers' minds about what to give priority to in their feedback practice and what to exclude as irrelevant for learning purposes.

which teachers adopt to provide feedback. In western communities where the concept of progressive learning has gained currency, and where it is believed the student's brain is not a tabula rasa (or blank sheet) on which adults should inscribe everything instructional, teachers will tend to celebrate learner autonomy by encouraging students to engage in independent thought and action and to realise their learning potential. In other learning communities where students are expected to rely exclusively on teachers to plan and provide everything for them, they will not be encouraged to take personal initiative in intellectual development. Teachers will more likely correct students each time they make mistakes without giving them opportunities to correct themselves, although it is a practice many researchers have identified as not very helpful for learning. James (1998) for instance, believes that it tends to limit the possibility of students becoming self-reliant and self-confident when handling tasks of an intellectual nature.

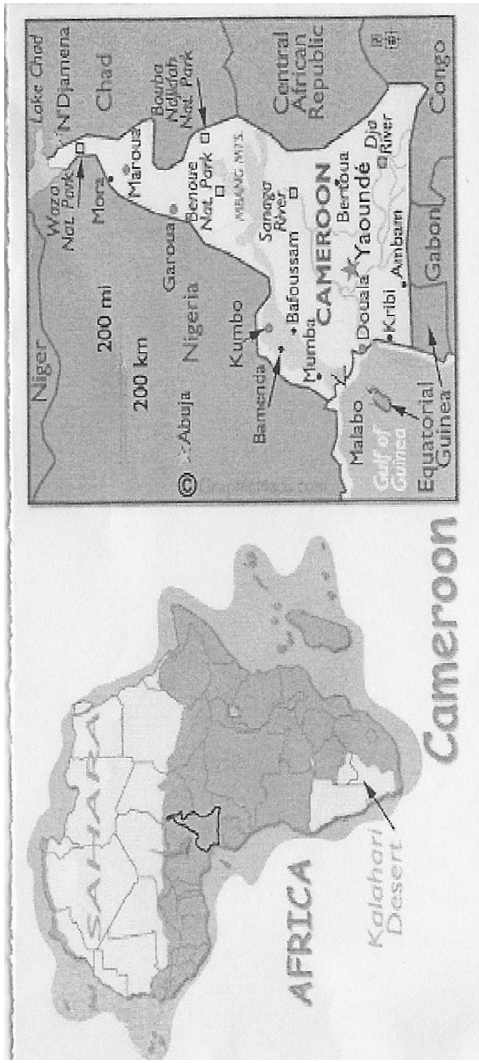
It should be said, finally, that assessment, feedback and learning processes do not occur in vacuo; they are fundamentally social processes taking place in social settings, conducted by, on and for social actors. In one way or another, aspects of these settings are bound to influence how teachers give feedback and how students learn from it, hence, should not be overlooked in any study on the effectiveness of teachers' classroom feedback practice. It is for this reason that in the next section, I examine the relevance of context, drawing attention, specifically, to how linguistic and socio-cultural factors in classrooms in Cameroon can impinge on the feedback for learning process.

1.1.2 The importance of context

The Linguistic situation and influences on feedback for learning

Language impacts on the relationship between feedback and learning. If one takes a constructivist view of learning that accentuates teachers' interactive role in students' learning (Vygotsky, 1978), the teacher's language becomes the key mediating factor during interaction with students. This is because it is principally through oral and written language that teachers construe and deliver feedback and students' understanding and the extent to which they make cognitive gains thereof will depend on their ability to process their teachers' language.

Fig. 1.1 Map showing the position of Cameroon along the West African coast



Several aspects of the linguistic situation of Cameroon[2] allow for particular complexities in the way feedback works for learning. There is some evidence that for some time, English-speaking Cameroonian students taking the GCE Ordinary level examination have, overall, consistently demonstrated low levels of success in all aspects of the English language paper (See *Association for Educational Assessment in Africa, 18th Annual Conference Proceedings, 2000*). If this implies insufficient individual competence in this language among other things, then one can conclude that these low ability levels also affect students' comprehension of teachers' classroom discourse and the input (including feedback input) they get from teachers. In other words, it is likely that much of what teachers intend to pass across as feedback during lessons does not get through as students do not understand teachers' language well enough.

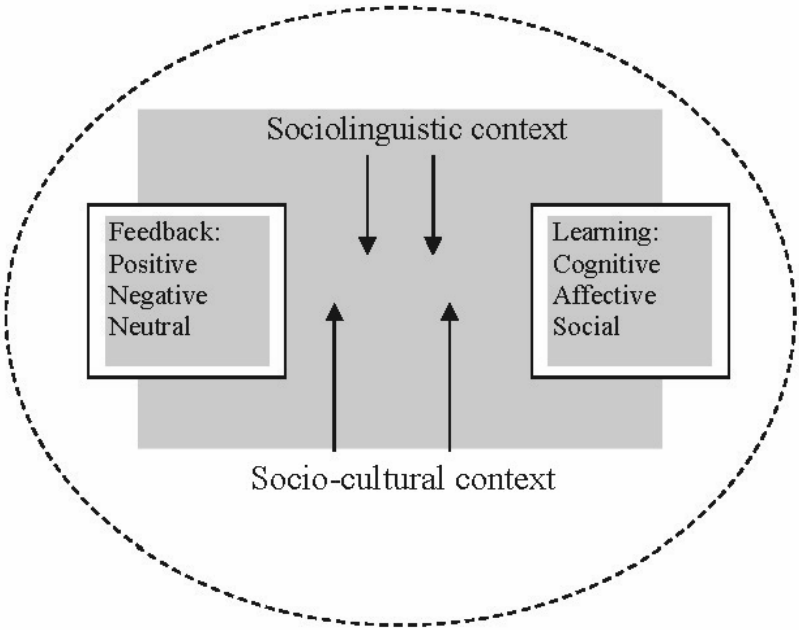
It is important to state here that the Cameroon Government does not place as much emphasis on indigenous languages.

There are several possible explanations for this, one of which is the following: To ensure that students gain sufficient mastery of one of the two official languages in Cameroon, but not at the expense of the other, students are expected to study English and French (both of which are foreign languages) at secondary school. Upon completion, they are required to achieve 'a respectable degree of proficiency' (Chumbow, 1980) in the two languages. As Tadadjeu (1997) has shown, the majority of them are not used in schools for literacy and this seems to have adverse effects on students' mastery of English and French in a way that is best explained by Cummins' hypothesis (1984, 1986).[3] It has been argued that

[2] None has captured the complexity of the linguistic situation more vividly than the late Professor Fonlon: 'It is in Cameroon that the African confusion of tongues is worst confounded' (1969:8). Cameroon, which is called 'Africa in miniature' offers a clear example of sub-Saharan multilingualism. As Todd (1984a:160) notes, 'in addition to the vernaculars which may be classified as local, oral, domestic languages, there are two official languages, namely, English and French; one widely used but unofficially recognised lingua franca, Cameroon Pidgin English; a number of African languages of wider communication including Douala, Mungaka, Bulu, Ewondo and Hausa; and a non-indigenous language, namely, Arabic.'

[3] Cummins (1984, 1986) is noted for his contribution to research in this area through his famous 'threshold hypothesis'. The hypothesis suggests a relationship between bilingual competence and cognitive development and proposes that there may be threshold levels of linguistic competence which bilingual children, like the

Fig. 1.2 Conceptualising an uneasy relationship between feedback and learning



children's success in a second or foreign language may also depend on how developed their skills are in their home language. This hypothesis has prompted proposals for early schooling in the mother tongue. When the home language tends to be denigrated by others and selves, it would appear appropriate, Cummins (1986:18) argues, to begin initial instruction

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ones in Cameroonian classrooms, must attain in order 'to avoid cognitive disadvantages and to allow the potential beneficial aspects of becoming bilingual to influence cognitive functioning' (1986: 6). Two threshold levels of bilingual competence are hypothesized, the lower and the higher levels (also see Romaine, 1994:238). Cummins argues that below these threshold levels, children's competence in a language may be sufficiently weak and their cognitive growth would suffer as a result e.g. as in 'semi-linguals' who do not have sufficient knowledge of the two languages in a bilingual learning situation. However, children whose competence extends beyond the higher threshold level e.g. 'balanced bilinguals' who have sufficient knowledge of both languages are likely to be able to reap the benefits of bilingualism (Romaine, idem). If one were to go by this theory, it would be useful, then, that students be able to have an acceptable level of proficiency in their first and second languages.

in the child's first language. The argument here is that children in foreign language classrooms who lack instruction in their first language do not have the opportunity to develop 'cognitive academic language proficiency', a universal underlying proficiency shared across languages, which they require to be able to easily learn other languages. It is unlikely that mastery of up to two foreign languages will follow smoothly when the mother tongue is yet to be sufficiently mastered. Other factors impacting on the feedback for learning relationship have their origins, as Fig. 1.2 shows, in the social and cultural contexts of teaching and learning in Cameroon.

Socio-cultural influences on feedback for learning

The school as an institution has its own culture, a micro culture in which is embedded a classroom culture, and both of which are microcosms placed within the wider educational macro structure of a given society. Understanding the way feedback works in schools requires understanding the influence of the socio-cultural input that learners bring with them to class on their daily learning experiences. For example, Kimball (1974) found that students from the same tribe as their teacher (s) tend to get closer to the latter socially; they identify with one another, first, as members of the same school and classroom, but, more importantly, as belonging to a wider and often more valued socio-cultural entity. Such students were found to engage more conversationally with their teachers during and after lessons and even out of school. The researcher concluded that every other factor remaining constant, students 'whose links with teachers extend beyond classroom confines are more likely to benefit from teachers' attention than their peers-and are more likely to concentrate more in these teachers' lessons (p. 294).

As we have seen above, the relationship linking teacher feedback and student learning is neither smooth nor linear but is usually characterised by uncertainties, not least of which is whether linguistic and socio-cultural aspects interfere with the wider learning context. The question to be answered now is why write a book on feedback and learning; also, how relevant is it to the educational system of Cameroon and, potentially, to other school settings across the world? The answer to this question can be found in the rationales for the research carried out. The first rationale concerns the general significance of the study and is meant to serve the wider community of teachers, students and educational researchers worldwide.

1.2 Rationale for the research

1.2.1 Why a study on feedback and learning?

The more we study how classroom feedback works in learning, the more we will know which forms are useful for improving standards of achievement and to make use of such forms to enhance the quality of teaching and learning in schools. Many concerned with classroom assessment-related research have recognised how useful teachers' feedback is as a legitimate area of inquiry and have variously illustrated this in terms of how teachers, and students in particular,
could benefit from research into and practice of feedback provision.

- The student stands to benefit educationally from his or her tutor's response to what they have produced; feedback or knowledge of results then becomes 'the life-blood of learning' (Rowntree, 1987:24).
- Sadler (1989:119) considers feedback 'the key in formative assessment' which enables pupils to close the gap between their actual performance and what is expected of them by teachers or schools.
- Teachers' feedback is one of the many classroom processes that enable students to arrive at cognitive change i.e. to build new knowledge (Pintrich et al, 1993).
- Davis (1998:6) claims that through formative assessment and subsequent reporting, feedback enables pupils to learn more effectively and to make progress.
- Feedback generated from students' work helps teachers modify teaching techniques when they realise students have not done well (Black & Wiliam, 2003).
- It enables teachers to verify that students have understood previous lessons so that they can introduce a new topic in their lessons (Tangie, 2015).

While the literature on how feedback influences learning is extensive, systematic studies (based on empirical research in classrooms) into linguistic and socio cultural conditions under which feedback promotes learning have, by comparison, received sparse attention. It is useful, therefore, to conduct studies that will help educationists and educational researchers understand the tensions and conflicts that are likely to interfere with the feedback for learning process: that inhibit the appropriate provision of feedback, the provision of suitable feedback by teachers and the uptake and use of such by students. A study conducted in secondary

classrooms in Cameroon should certainly be relevant to Cameroonian education, which leads me to the next discussion.

1.2.2 Relevance of the study to Cameroonian education

I am not aware of any study (empirical or non-empirical) that has documented how students in secondary schools in Anglophone Cameroon[4] are given information about the quality of their work and/or conduct and of the role this plays in their learning. The present study reported in this book is arguably the first and hopefully a step in the right direction. According to the Association for Educational Assessment in Africa (2000), contemporary educational researchers in Anglophone Cameroon (notably those interested in school-based assessment and evaluation), seem to be more preoccupied with other issues related to assessment e.g. the reliability and validity of teacher-made tests, challenges faced by the Cameroon GCE Board in the management of certificate examinations, but not with how secondary teachers provide feedback, nor whether it has an effect on learning and if so, what effect. For example, only little interest has so far been demonstrated towards teachers' use of positive, negative or neutral feedback[5] in naturally occurring classroom discourse or in their

[4] The Republic of Cameroon is geographically and linguistically split into two large communities. French-speaking or Francophone Cameroonians make up the bulk of the ten administrative provinces, while English-speaking or Anglophone Cameroonians make up the minority, two provinces: the North West and South West Provinces. 'An Anglophone Cameroonian citizen is taken to mean a person whose first official language in the context of the Cameroon Constitution is English. Although Cameroonian Anglophones by this definition may hail from any part of the country, their base is mainly the South-West and North-West provinces' (Tambo, 1993).

[5] Conventionally, and in school feedback literature, 'positive feedback' is considered one that is meant to be complimentary, to please, as in acceptance of students answers to questions, encouragement and praise, while 'negative feedback' is meant to displease as in criticism, warning or punishment. What is neither positive nor negative would be 'neutral' e.g. probing students to say more about a point they have raised, asking them to correct work they got wrong the first time. This is the distinction I take issue with in this book. However, I termed the third category 'neutral feedback' only for want of a better label because in reality, its role in learning is far from being 'neutral' as analysis of data in subsequent chapters will show. Also, it is worthy to say that the terminologies are only labels for feedback analysis; conceptual boundaries between them are not always clear-cut, especially when one considers that an easily identifiable approving remark may mean different things for different audiences (may be interpreted variously as positive, as negative and as neutral feedback), or may be interpreted as having

comments on pupils' written productions. 'The effects of intrinsic rewards on students' performance in schools in Buea sub-division', 'Manifestations and handling of disruptive behaviour by secondary school teachers in Tiko district', 'The impact of corporal punishment on the learner' are examples of empirical research into issues related to positive and negative feedback that a few research students at the only state-owned Anglo-Saxon university in the country have attempted. These, however, are small-scale studies with findings yet to be published. It is with these considerations in mind that I have decided to direct attention to these issues, beginning with an inquiry into the relationship between teachers' feedback and pupil learning.

In this book, I aim therefore, to explore the relative effectiveness of different teacher feedback types on students' learning with particular regard to the context-sensitivity of the learning situation, and to use this exploration to suggest ways and means of enhancing feedback systems and practices in secondary schools in Cameroon and beyond. It is hoped that findings will assist governments and policy makers worldwide in developing a feedback policy that can be effectively implemented to promote 'good' feedback practice in classrooms. It is useful at this point to discuss theoretical inputs to the study.

1.3 Theoretical inputs to the study

To conceptualise the research question, I relied on two theoretical approaches, behaviourism and socio-cultural theory, drawn from the field of Psychology. They both have a bearing on my research as they emphasise in different ways the role of the teacher, of the learner, of language and of culture in the learning process. Each theoretical perspective will
be examined in the light of two questions:

- How does it work in the educational setting?
- What contribution does it make to our understanding of the concept of feedback for learning?

I begin this section by discussing the place behavioural learning theory has in this book.

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multiple functions. These issues are discussed in more depth in subsequent chapters of this book.

1.3.1 A behavioural approach to the study of feedback and learning

It becomes difficult to exclude a theoretical perspective like behaviourism from a study which deals with such overt and publicly observable phenomena as teachers' utterances and pupils' actions that trigger them. Behaviourism as a concept in Psychology 'is concerned with the ways in which people or animals learn through interaction with their environment' (Pollard and Filer, 1999:3). Many teacher feedback behaviours e.g. praising and punishing, directly reflect behaviourist principles and each of these can be analysed in terms of its relationship to its antecedents (pupils' actions that trigger feedback responses from teachers) and its consequences (the apparent effects teachers' reactions have on students). In more practical terms, teachers ask questions in class, pupils answer them, and teachers deliver judgements on the adequacy of pupils' responses that can cause pupils to modify them. It is possible, therefore, for teachers to control their students' reactions in class by simply providing them with the appropriate stimuli (Skinner, 1974). For example, teachers can reinforce positive academic and social behaviours in students i.e. making it possible for them to repeat such behaviours by a) providing them with positive reinforcers in the form of praise or rewards and b) withholding negative reinforcers in the form of reprimands or punishment. In the same way, unwanted behaviours can be eradicated by supplying or not supplying the appropriate environmental stimuli that are likely to make them occur (see Table 1.1 below)

It seems reasonable to suggest, on the basis of the above discussion, that if more attention is paid to the social environment in which children learn and, particularly, to the environment as represented by teachers' behaviours, this will lead to pupil learning that is both efficient and effective. However, none of the foundation principles of behaviourism captures learning in cognitive terms; the theory's contribution to classroom learning, it seems, is limited to the area of discipline. As Blackman (1984:9) argues, it 'offers educational methods of classroom management in which principles of behaviour modification are applied to the routine management of classes (and individual pupils) in order to sustain an environment conducive to the attainment of educational goals'.

Table 1.1 A model of behaviour modification showing responses and consequences

	To increase behaviour (s)	To reduce behaviour (s)
Delivery of	'Good things', i.e. rewarding with smiles, sweets, toys, praise, tokens, good marks, comments. 'Positive Reinforcement'	'Bad things', i.e. punishing with smacks, frowns, reprimands, criticism, bodily injury, etc. 'Punishment'
Removal of	'Bad things', i.e. allowing escape from pain, noise, nagging, threats, etc. 'Negative Reinforcement'	'Good things', i.e. losing money, privileges, house points, opportunities to learn good things. 'Response Cost'[6]

Source: Wheldall & Merret (1984 b:16)

Also, the theory's description of environmental events likely to follow student behaviour is limited to punishing and rewarding that make up only part of teachers' positive and negative feedback behaviour. Research has shown that teachers respond to pupil stimuli in several other ways that cannot necessarily be described as positive or negative e.g. by probing, clueing, providing advice towards self-assessment, self-regulation and retrial. These are given no consideration though they appear to be much more at the centre of students' learning (Tangie, 2015, Tunstall & Gipps, 1996a, b). From an educational perspective therefore, it is an empirical matter to identify which particular consequences for behaviour e.g. praise, blame, correction, etc exert reinforcing or punishing effects on the behaviour of any student, and conditions or circumstances under which this happens.

Finally, the theory does not account for social and cultural aspects of the environments in which teaching and learning take place. Its theorists assume a one-to-one connection between teachers' actions (praise, punishment) and students' reactions (e.g. compliance), but fail to acknowledge that several factors interplay in such a relationship. The

[6] Wheldall & Merret explain 'Response Cost' as a form of punishment that involves withdrawing or terminating positive consequences as a means of decreasing the occurrence of undesirable behaviours e.g. withdrawing weekly financial allowance from students (1984b:21).