Student involvement in the assessment process in a first year University Geography module: influencing their approach to learning

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A dissertation submitted to the Centre for Higher Education Studies,
Faculty of Education, University of Natal, in partial fulfilment for the
Degree of Master of Education (Higher Education)

Durban, November 2001

DECLARATION

The work described in this document was carried out in the Geography Division of the School of Life and Environmental Sciences at the University of Natal, Durban in my capacity as a Senior Tutor. These studies represent my own original work and have not been submitted in any other form to another University. Students and tutors agreed to take part in the process and where mention is made to work of others, it has been duly acknowledged.

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ABSTRACT

The assessment procedures utilised in first year Geography modules at the University of Natal Durban were critically reviewed. This revealed a rather narrow approach with an emphasis on summative assessment, limited feedback and a hidden assessment agenda with no student involvement. It was recognised that this traditional approach encouraged a surface approach to learning. In order to broaden the range of assessment procedures available to the students and to improve upon the assessment practice in general, peer and self-assessment exercises were incorporated into a first year module (Environmental Geography 1) during this study. It was felt that by participating in peer and self-review exercises, students' self-reflective skills could be developed in order to equip them to become life-long learners. The main aim of the study was to integrate assessment with learning and to determine whether active involvement in the assessment process provided insight into the process and positively influenced students' motivation, attitude and approach to learning.

The study, which was conducted over a two-year period using an action research approach, revolved mainly around an essay test students wrote a few weeks into the module. During tutorials prior to the test students were introduced to the skill of essay writing and the concept of criteria by which essays could be assessed. After the test, using a criteria sheet and model answer, students were expected to mark (i.e. provide both written feedback as well as a grade) both an essay of an anonymous 'peer' as well as their own test essay. The lecturer subsequently marked the test as well as the actual assessment done by the students. Quantitative comparisons of student-awarded grades and lecturer-awarded grades, as well as a qualitative analysis of student and lecturer feedback during the process, and comments from the evaluations, revealed some general trends from both iterations:

- Students showed increased insight into the process of self-assessment with practice.
- Good students tended to under-estimate, poor students over-estimate grades.
- Students were critical when marking an anonymous peer.
- Students tended to be less critical when marking themselves.
- Students battled with understanding/implementing certain criteria.
- Students found it hard to separate out content from structure and style in an essay.
- Students generally saw credit and value in the process of self-assessment.
- Students were generally positive about the process of self-assessment
- Students were reluctant to engage in the process of self-assessment on a more regular basis

- Students felt the feedback comments from the lecturer on the self-assessment were the most valuable learning exercise.

A large part of the success of the study was that, through integrating assessment in the learning process, students were able to be more critical of their own work. This in turn should pave the way for them being able to work in more self-reflective and independent ways in the future. Furthermore, the study served to open up dialogue with students with respect to our teaching and their learning. By participating in the peer and self-review process they became more aware of the "hidden" aspects of the curriculum. Students appear to have acquired an awareness of the value of criteria in assessment and were able to apply them to some degree in their own context. In general, students felt they had a beneficial experience in peer and self-assessment.

The study highlighted a number of issues that need addressing. Firstly, there was a large gap between lecturer expectations in a written answer and what the students felt was acceptable. In particular, students had problems with being able to discriminate and internalise certain criteria such as 'relevance of information' and in general resorted to what has been termed the 'shotgun' approach when providing answers. It is recognised that interpretation of such gaps in understanding have social, cultural and political contexts. Secondly, the actual awarding of grades was an intimidating process for many students and should be done in a less threatening way in the future. Thirdly, from a personal point of view, it is recognised that it requires not only a high level of critical reflection but also active engagement and discipline to make necessary changes in an action research process.

A conceptual framework in which traditional and educational forms of assessment are represented as two extremes of a continuum of student-lecturer involvement, is presented. This helps to locate the present study and provides direction for future assessment studies in which student learning is the central focus.

ACKNOWLEDGEMENTS

Firstly, I gratefully acknowledge the role my supervisor Ruth Searle has played in providing guidance and encouragement throughout the process of the thesis. The prompt and constructive feedback was particularly appreciated. Thank you Ruth.

Secondly, I wish to thank all the students and tutors who participated so willingly in the process. As a result of their honesty and candour, the data in this study has proved to be rich and informative. Hopefully it will also prove to have been of value by feeding into the improvement of the teaching and learning interactions in future geography modules in the School.

Finally, I would like to thank Fred for his unwavering support throughout my participation in this degree. Gracias, mi marido!

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1. INTRODUCTION

1.1 Background to the study

Assessment procedures can take many forms and have many purposes. Traditionally, assessment in education has had a summative, accreditation function, which essentially judges the extent to which certain skills and knowledge have been mastered (Cox, 1996). The academic merit of this approach to assessment has been constantly questioned and in recent years there has been a general, world-wide shift in education practice, due to both external and internal pressures, towards integrating assessment with learning. There is thus a move away from the traditional, summative approach to assessment to one that tends to be more formative with an emphasis on integrating assessment with learning, which as a result has greater educational value. It was in this context that the assessment procedures utilised in first year Geography modules in the School of Life and Environmental Sciences, Natal University (Durban), were critically reviewed by the author in an assignment for an MEd (Higher Education) degree (Ellery, 2000). The following is a brief analysis from this assignment.

There are essentially four forms of assessment in all the first year Geography modules. These consist of weekly assignments completed during practicals and tutorials, written tests, a large essay or report assignment and the final exam. For the tutorials and practicals the students usually hand in a written document that is marked by a post-graduate student and returned the following week. Although this can be an effective means of providing feedback to students, two issues were raised in this regard. Firstly, the level of competence of the post-graduate played an important role in terms of effectiveness of the feedback the students received. Secondly, the topics covered, particularly in each tutorial, could be more supportive of student learning. It is recognised that the opportunities for teaching skills (such as writing skills, presenting data *etc*) are enormous in this context and could be better used to facilitate student learning. Teaching content can be used as a vehicle for teaching process as well.

Despite much time and effort being spent on the tutorials and practicals, they only represent a small proportion of the class mark. In contrast, the written tests count a great deal, representing a bias towards summative assessment, as well as a bias towards content. Usually two or three tests are scheduled for each semester-long module, with the intention of providing students with feedback from which they could learn. However, except for perhaps the first test, the lecturer concerned often does not return the tests until the end of the semester. As a result most students do not view their scripts again and the notion of students learning from their assessment is negated.

The other fairly important contributor towards the class mark is a large essay or report assignment. The students are provided with a booklet containing sections on academic writing (reports and essays) which they are expected to consult. The poor standard of essays indicates this is in fact an ineffective way of imparting information. Furthermore, the criteria upon which they will be assessed are not specified. Since the assignments are usually handed in close to the end of term, they are again used for summative purposes rather than for formative feedback and the lecturers' feedback comments are usually of a very general nature. As a result the students learn little about the process (essay or report writing) by doing these assignments.

From the above brief analysis of the assessment procedures in the first year Geography modules, a number of problem-areas have been highlighted:
a) Since tutorials are the one area in which feedback occurs throughout the module, they could be used more effectively for learning to learn (learning of skills).
b) Feedback from tests and assignments needs to be more thorough, as well as timeously implemented, for effective student learning.
c) The assessment agenda is not transparent to the students (for example students are unaware of assessment criteria).
d) Students are not involved in the assessment process at all.
e) Despite a number of different assessment procedures being implemented, the range of competencies being assessed is rather narrow.
f) There is a need to integrate assessment in the learning process. In other words it needs to be used as a learning strategy in itself.

It was within this context that the current study was implemented. In order to broaden the range of assessment procedures available to students and to improve upon the assessment practice in general, peer and self-assessment exercises were incorporated into a first year Geography module (Environmental Geography 1). The main purpose of the study was not for accreditation, but to incorporate assessment better into the learning process and provide meaningful and effective feedback to ensure learning does in fact take place more effectively. In other words it was a formative rather than a summative exercise for the students.

Numerous studies have indicated that peer and self-review as part of formative assessment can be extremely useful in assisting students to develop their own self-reflective skills and hence become more self-reliant with respect to their own academic development, and thus more empowered (Orsmond *et al.*, 2000, 1996; Falchikov, 1995; Boud, 1989; Boud & Falchikov, 1989). This is

largely because peer and self-assessment provide lecturers with the opportunity to a) outline clearly student learning outcomes and assessment criteria, b) open up dialogue with students, and c) encourage students to think about the process of assessment rather than simply the product (Orsmond *et al.*, 2000). This approach encourages students and gives them the confidence to be more flexible and prepared to take responsibility for their own learning and their own continual personal and professional development. In other words it equips them to become life-long learners (Dochy *et al.*, 1999) – an ethos prevalent in the present educational setting in South Africa. Peer and self-assessment therefore shifts the emphasis away from content learning to an approach in which students are learning to learn.

Since Geography depends largely on writing as a method of assessment, the skill of writing is required of all students. However, writing is not *actively* taught in the Geography Division, but students are given many written assignments based on the assumption that with practice they will automatically improve. This is only partially true. It has been shown that the learning process can be greatly facilitated by actively teaching skills and by providing more continuous feedback (Cox, 1996). This study attempts to address this through a number of different interventions by:

(a) incorporating the teaching of essay writing skills into the tutorials,

(b) opening up dialogue with students with respect to assessment and assessment criteria, in particular essay assessment criteria,

(c) using peer and self-assessment of essay writing as a form of feedback as well as a means of engendering a self-critical approach to their own learning to encourage independent learning.

1.2 Purpose of the study

This study was instituted to better integrate assessment into the learning process. By involving students more fully in, and providing them with more insight into, the assessment process, they should develop a better understanding of the assessment process, which would in turn impact positively on their own learning. Personal observation had indicated that students' expectations of grades did not match reality, which led to frustration and lack of credibility of the lecturer from the students' perspective. It was felt that a contributing factor to this mis-match of expectations and reality was a lack of explicitly stated criteria upon which students are regularly assessed as well as a general lack of understanding of the assessment procedure. This dissertation describes a peer and self-assessment exercise in a first year module that tries to address these problems. It was centred around a class test that was written early on in the semester. The study was conducted over a two year period, with lessons learnt from the first iteration feeding into the process and improving upon the teaching and learning interactions in the second.

The **main focus of the study** was therefore to integrate assessment with learning and to determine whether active involvement in the assessment process provided insight into the process and thereby positively influenced students' motivation, attitude and approach to learning.

The **key questions** addressed in this study were as follows:

1. Did involvement in peer and self-assessment assist in moderating student expectations of grades?
2. How, and in what way, did student assessment grades compare with those of the lecturer?
3. Did a breakdown of criteria assist in the peer and self-assessment process?
4. Did involvement in peer and self-assessment affect motivation, attitudes and approach to learning?

2. CONCEPTUAL FRAMEWORK: ASSESSMENT IN EDUCATION

2.1 What is assessment?

The practice of assessment has long been firmly rooted in the positivist and reductionist paradigm in which assessment was viewed as an authoritarian, objective, context-free process which assumed intelligence as a fixed, measurable entity (Lunt, 1993). A shift in thinking in the last forty years or so has offered alternative approaches to teaching and learning, and assessment in this context tends to be a more subjective, context-laden process based on human interactions and judgements which assumes knowledge is constructed. It is from this critical theory paradigm that I have chosen to define assessment, using the human-centred description by Rowntree (1987: p4):

> 'Assessment in education can be thought of as occurring whenever one person, in some kind of interaction, direct or indirect, with another, is conscious of obtaining and interpreting information about the knowledge and understanding, or abilities and attitudes of that other person. To some extent or other it is an attempt to *know* that person. In this light, assessment can be seen as human encounter'

This definition emphasises the intimacy, subjectivity and professional judgement involved in assessment (Luckett & Sutherland, 2000), and is discussed in more detail later in this review. But first, the issue of the influence the assessment process has on the way students learn requires examination.

2.2 Influence of assessment on learning

The way students learn has been the focus of research for some time. Three different approaches to learning that have been identified and widely accepted in the educational literature are that of deep, shallow or surface and strategic approaches to learning (Ramsden, 1992; Entwistle, 1983; Entwistle & Ramsden,1983). A student adopting a *deep* approach to learning tends to be intrinsically motivated to learn more about the subject. This usually entails discussion, reading and reflection, resulting in a broad understanding of the subject. Learning involves meaning and understanding, and it is the learner who constructs the knowledge rather than the educator. In contrast, a *surface* approach to learning occurs when a student is extrinsically motivated to learn – usually to pass a particular test or course. Students thus focus on selected details of content and seldom develop a broad, holistic understanding of the subject. The educator is viewed as the transmitter, and the learner as the receiver, of knowledge. The third approach described is that of the *strategic* learner.

Here the main motivation is achievement of high grades, and revolves around optimising effort and time to achieve this end. This approach can involve both deep and surface approaches to learning.

There are many factors that influence the way students learn, such as previous knowledge and experience, types and levels of motivation, student interests, intellectual skills, levels of anxiety and expectations about what is to be learned (Entwistle, 1983). However, it is well recognised that *assessment* is a critical component of teaching and influences the type of learning that takes place (Ramsden, 1992). In fact, it has been argued that assessment is the single most influential factor on student learning (Falchikov, 1995). A surface approach to learning is encouraged by assessment procedures that require recall of a great detail of content and focus on the final product of learning rather than on the process. In contrast, a deep approach to learning is encouraged by assessment procedures which engender long, active engagement of tasks (Ramsden, 1992). In a recent paper Gibbs (1999) makes the suggestion that one uses assessment strategically to change the way students learn. He indicates that even subtle changes to the assessment *method* or to the assessment *task* can produce fundamental changes to the quantity and nature of student effort and learning style. Boud (1995a) extends this idea by highlighting the importance of the students *interpretation* of the task at hand. He states that not only the assessment process influences the students actions, but these can also be influenced by the context of the subject and by the total educational experience of the student.

Therefore, despite assessment procedures often being carried out for accreditation, predictive and diagnostic purposes as well as for quality assurance (Luckett & Sutherland, 2000), it was in the context of *assessment influencing the way students learn*, that this study was initiated. The next section (2.2.1) details how 'traditional' forms of assessment, well entrenched in institutions of higher learning, encourage a surface approach to learning. The following section (2.2.2) examines how, by integrating assessment in the learning process (termed 'educational assessment'), a deeper approach to learning is engendered. This study is discussed in the light of educational assessment (section 2.2.3).

2.2.1 Traditional assessment and its influence on learning

Traditional types of assessment, usually in the form of formal tests and exams, tend to be summative and mainly for accreditation purposes. The focus is on content and the final product of learning. The criteria in traditional assessment tend to be implicit and marking as a result is norm-referenced. The basic assumption in traditional assessment is that intelligence is a fixed, objectively measured entity and that testing should be context-free (Jacob *et al.*, 1999). This is based on the

behaviourist education theories which assume that behaviour can be accurately pre-determined and brought about in others in a rational, straight-forward way, and that this behaviour is often a summation of individual experiences (Zuber-Skerritt, 1992). Furthermore, the learner is assumed to be a passive receiver of knowledge and the educator is the knowledge expert with the necessary skills and techniques to transfer this knowledge to the learners. The assessment process usually follows from a transmission mode of teaching.

Some of the problems associated with traditional forms of assessment are outlined below. Although they have been presented as separate issues, they are not necessarily mutually exclusive.

1. Since there are no transparent criteria by which students are assessed, the process appears, from the students' perspective, to be shrouded in secrecy. This can lead to high levels of anxiety (Jacob *et al.*, 1999).

2. With an emphasis on exams and tests, only a limited range of competencies can be assessed. The emphasis is on memory and lower order skills which encourages rote learning (Jacob *et al.*, 1999).

3. Students tend to focus on what will be assessed at the expense of gaining broader understanding of the topic (Elton & Laurillard, 1978).

4. Good grades do not necessarily mean that students have understood the key concepts (Dahlgreen, 1984).

5. Little or no feedback is provided to students (Lund, 1995)

6. Assessment is not usually linked to the intended learning outcomes, which undermines the learning process (Lund, 1995).

7. With staff being in control of the aims, objectives, tasks, criteria and outcomes of the assessment, this discourages students from becoming autonomous learners who can take responsibility for their own learning (Boud, 1990).

8. Since the nature of the assessment task influences the approach to learning (Ramsden 1988), traditional forms of assessment encourage a passive, surface approach to learning.

2.2.2 Educational assessment and its influence on learning

As stated in the Introduction, there has been a general shift away from traditional assessment towards integrating assessment with learning. This trend is being mirrored in the South African context with the transformation of education in general and of higher education in particular. With the implementation of the South African Qualifications Authority (SAQA) Act of October 1995 and the White Paper on Higher Education in 1997, assessment is shifting towards an approach that has greater educational value, henceforth referred to as educational assessment.

Educational assessment procedures can be both summative and formative. They tend to integrate knowledge, skills and values and the process of learning is considered to have the same value as the product (Lunt, 1993). Assessment criteria, which link directly with course objectives, are clearly stated and shared with the learners (Gipps, 1994). Feedback to learners is also a key factor in the assessment process (Falchikov, 1995; Gipps, 1994). These educational assessment procedures are based on constructivist educational theories which view learning, unlike in the behaviourist theories, as a holistic, whole-person process. The assumption, therefore, is that assessment is based on human interaction and judgement and that assessing achievement is not an exact science (Gipps, 1994). It is also assumed that intelligence is culturally and contextually dependent (Jacob *et al.*, 1999).

With educational assessment, many of the problems associated with traditional assessment fall away.

1. Integration of assessment in the learning process usually encourages students to think and results in their adopting a more active, deep approach to their learning (Gipps, 1994; Jacob *et al.*, 1999).

2. With clearly stated, shared criteria the process is far more transparent and thus less stressful for students (Jacob *et al.*, 1999).

3. A broader range of approaches allows for a much fairer assessment as students are not disadvantaged by a single type of assessment (Lund, 1995). The inclusion of a variety of assessments also allows for more contextualised and hence more meaningful learning situations (Gipps, 1994).

4. Since educational assessment operates outside the 'single right answer' paradigm, knowledge is more often constructed, through self-analysis and learner autonomy. The resultant flexibility is a motivating factor for students (Jacob *et al.*, 1999).

2.2.3   Assessment in this study

For many years the main goal of higher education has been to make students knowledgeable within a certain domain (Dochy *et al.*, 1999). As a result, the emphasis on teaching, learning and assessment has followed similar lines and focussed on content. The main goal in higher education however, is moving towards supporting students to develop into 'self-reflective practitioners' (Schön, 1987), 'independent learners and critical thinkers' (Boud, 1986) and 'self-determining individuals' (Heron, 1988). Some authors have expressed concern that traditional forms of assessment are not consistent with these goals (Boud, 1989; Heron, 1988). An evaluation of

assessment methods in the Geography Department (University of Natal) indicated such an inconsistency between the goals of the curriculum and the assessment methodology applied (Ellery, 2000). The emphasis on content, product and specific outcomes, with little concern for the *process* of learning, was indicative of a narrow approach to education. As such, the approach in this study was to institute *educational* assessment where it is viewed as an integral part of the learning process. By using this approach students are encouraged to develop skills of *learning how to learn*, how to *monitor* their own work and how to *make judgements* about the worth of their achievements (Boud, 1990). The transformative nature of this study indicates a shift towards the critical theory paradigm with regards to teaching and learning. This change in approach, and rationale for such a change, are eloquently described by Heron (1988: p57-58):

> 'Unilateral control and assessment of students by staff means that the process of education is at odds with the objective of that process. I believe the objective of the process is the emergence of an educated person: that is a person who is self-determining – who can set his *(sic)* own learning objectives, devise a rational programme to obtain them, set criteria of excellence by which to assess the work he produces, and assess his own work in the light of these criteria – indeed all that we attribute to and hope from the ideal academic himself. But the traditional educational process does not prepare the student to acquire any of these self-determining competencies. In each respect, the staff do it for or to the students. An educational process that is so determined by others cannot seriously intend to have as its outcome a person who is truly self-determining.'

2.3 Methods used in educational assessment

With assessment becoming an integral part of the teaching-learning process, the nature and form of assessment must represent a departure from the traditional, summative mode of assessment. In this regard records of achievement, portfolios, peer and self-assessment, projects, group work, different presentational formats (other than essays - such as orals, posters *etc*), learning logs, diaries, reflective journals, observation of demonstration of a skill, problem-based approach and continual feedback are all methods that can be integrated at some point or another into a curriculum.

Each assessment procedure has its own merits, and in implementing a particular procedure the educator is promoting a particular learning style (Gibbs, 1999). Two educational assessment procedures that have received much attention recently are those of peer and self-assessment. Since

these are the methods that were introduced into the teaching program in this study, they have been discussed in detail in the following sections.

2.3.1 Self-assessment

Boud & Falchikov (1989) state that self-assessment refers to involvement of learners in making judgements about their own learning, particularly about their achievements and the outcomes of their learning. In a slightly later work, Boud (1991) extends this definition by stating that in self-assessment students need to be able to identify criteria or standards students themselves, and make judgements on the extent to which they have met these criteria. This emphasises two stages in the process: that of identification of criteria and the making of judgements based on them. Students used to traditional assessment will not have been involved in either of these stages.

In a later work Boud (1995b) extends the concept of self-assessment even further. He argues that self-assessment may be viewed either as a *formal task* which is established by the educator, or as an *informal process* which good learners undertake all the time. Since the ability to critically assess one's own work is a goal of higher education, the introduction of formal self-assessment tasks should assist students developing the self-assessment skills in less formal situations. In the latter, students do not necessarily engage with a set of criteria or standards, but perhaps use an approach of reflective questioning. This is referred to as reflective evaluation by Somervell (1993). This approach tends to be more exploratory, may occur at any stage in the learning process and may not lead to any particular, expressible outcome (Brew, 1999). The relationship between reflection and self-assessment is well recognised (Boud, 1992; Boud & Knight, 1994; Sobral, 1997) and is discussed in more detail later.

The use of self-assessment tasks is mostly for formative purposes in order to encourage reflection on one's own learning processes (Dochy et al., 1999). This is a significant move away from the traditional purpose of assessment where the learning of content is emphasised. The difficulty of such a shift is discussed in section 2.4.1.

2.3.2 Peer assessment

Peer assessment is a process in which students make judgements or rate each other's work, often based on an identified set of criteria (Boud, 1995). Peer-assessment can take a number of forms as it may involve individuals commenting on the work of other individuals or groups, or it may involve groups commenting on the work of individuals or groups (Brew, 1999). The term is used to describe both the process of peer marking or grading, as well as peer feedback.

In this study peer assessment was used in a slightly different context compared with most other studies. Firstly, it was not seen as an end in itself, but rather as a single step in the process which enabled students to participate more fully in the self-assessment activities. This concurs with the idea of Boud's (1991) that peer assessment is part of the self-assessment process as it serves to inform self-assessment. Secondly, since peer assessment in this study was the marking of an essay written by an anonymous student from the previous year, the 'peer' was not known to the students nor present during the assessment process. This is most unusual in peer assessment. The issues of validity, fairness, effect of the process and accuracy of outcomes associated with having a known peer present during assessment therefore do not apply in this study. It is for this reason that the role of self- and peer assessment in the learning process are viewed together later (section 2.3.4) rather than as separate entities.

2.3.3 Collaborative assessment

The term collaborative refers to the participation of educators and learners in the assessment process in terms of determining what will be assessed, how it will be assessed and by whom (Dochy *et al.*, 1999). Whereas some authors (eg. Boyd & Cowan, 1985) reject the concept of a 'continuum of shared responsibility is assessment', due to the positive effects of students having to make decisions on their own, others such as Boud (1990: p110) feel that 'self-assessment in isolation is probably not a fruitful path to follow, but when moderated and used as an element of collaborative assessment its potential is great'. This statement is based on the assumption that students need guidance in the early stages of self-assessment, particularly for those that are used to a restrictive system in which the educator has control over the entire assessment process. Stefani (1998) also presents a compelling argument for educators to work 'in partnership' with learners, particularly in the context of assessment to enhance learning. In this regard Loacker & Jensen (1988) emphasise the need for feedback from the lecturer as a critical component of the student learning process.

It should be noted that in many instances, what has been referred to as self- or peer assessment in the literature, is in fact a form of collaborative assessment.

2.3.4 Role of self-, peer and collaborative assessment in the learning process

Numerous studies have indicated that peer, self- and collaborative review as part of formative assessment can improve the quality of learning in a number of different ways. Although they have been separated out here for ease of description, many of the effects indicated below are interrelated. Peer, self- and collaborative assessment are useful as there is generally:

1. Increased ability in self-reflective skills in terms of behaviour and performance (Orsmond *et al.*, 2000, 1996; Falchikov, 1995; Boud 1989; Boud & Falchikov 1989).

2. Increased responsibility for learning and self-reliance with respect to their own academic development (Orsmond *et al.*, 2000, 1996; Falchikov, 1995; Loacker & Jensen, 1988).

3. Increased awareness of the quality of the their own work (McNamara & Dean, 1995).

4. An increase in confidence in the ability to perform (Cutler & Price, 1995).

5. Increased awareness in the process rather than the product (Orsmond *et al.*, 2000).

6. An increase in student satisfaction (Boud, 1995).

7. Improved motivation (Ramsden, 1988).

8. Improved student performance in assessment in general (Orsmond *et al.*, 1996; Loacker & Jensen, 1988).

9. Improved personal and interpersonal skills (Falchikov, 1986).

10. An opportunity to open up dialogue with the students (Stefani, 1998).

For many years the main aim of higher education was to make students knowledgeable within a certain domain (Dochy *et al.*, 1999). As a result of pressure from market forces without, as well as a desire to improve the learning experience from within higher education, this aim has now shifted towards students becoming 'reflective practitioners' who are able to reflect critically upon their own professional practice (Schön, 1987). Students entering the market place need to be able to analyse and interpret information, solve problems, communicate effectively and to reflect in a constructive manner. As part of their higher education, involvement in peer and self-assessment should contribute to the development of *responsible, independent, self-reflective* citizens.

2.4 Implications of peer, self- and collaborative assessment for practice

2.4.1 Difficulty of introducing the process into practice

It is recognised that the introduction of peer, self- and collaborative assessment as part of a course is not always easy. It is important that the purpose and the procedure to be used are clearly stated. These assessment processes are usually unfamiliar to students who are used to the more traditional forms of assessment, and they thus give rise to anxiety and resistance (Woods *et al.*, 1988). Students must be willing to become aware of, and reflect on, their own learning processes and to take charge of their own learning and development. Woods *et al.* (1988) suggest various incentives to motivate students that might include an appeal to curiosity about their own development; the need to see skills such as thinking and problem solving as valuable, especially later in life in the

work place; as part of the course requirement and for awarding marks. The latter leads on to the issue in the following section, of whether grades and grading should be incorporated into the process.

2.4.2 Use of student-derived grades

It has been shown in many studies that peer and self-assessment as part of formative assessment helps students develop skills of reflection as well as responsibility for their own learning. However, the issue of awarding grades in a summative fashion is more contentious. Boud (1989) makes the point that if student generated grades are to be used officially it is necessary to show that students produce marks that are similar to those of the lecturer. The oft-repeated concern is that students will be over-generous to themselves or their peers (Boud, 1991), although mixed results have been reported. For example, Kaimann (1974) indicates a trend of over-marking in strong students and Boud (1989) a trend of over-marking in weaker students. Stefani (1994) in a study on reliability of student grades indicates that within the context of a clearly defined and carefully monitored assignment students do have a realistic perception of their own abilities and can make rational judgements on the worth of their peers. Similar reliability (within 10% of tutor assessment grades) was achieved in a study on peer assessment by Orsmond et al. (1996). Having said this, it is important to remember that differences do exist between different assessors, even between those that are considered to have some experience such as lecturers (Rowntree, 1987).

There is also the perception that students cannot be objective about their own work, particularly if they do not have the training or skills (Woods et al., 1988). However, the possibility of students not participating fully if the marks do not count, is a real one. Boud (1989) indicates a need to have a balance between a restrictive system of no student involvement, and a completely open one which is open to abuse. This can be achieved through collaborative assessment.

Collaborative assessment has been shown to be effective for summative assessment, giving accurate results (Stefani, 1998; Falchikov, 1986). This type of assessment can take various forms, but the most common appears to the weighting of grades arrived at by different participants in the process. The actual weightings are usually subject to negotiation. Although involvement of the lecturer may negate some of the value of developing reflective skills, this will in part be outweighed by the positive element of the process having more credibility with the institution and with students, especially those with little confidence in their own abilities.

Boud (1989: p27), quoted verbatim here, provides a very useful summary of situations in which student–derived marks may be legitimate. This occurs when (some are mutually exclusive):

1. There is a high trust, high integrity learning environment;
2. Students are rewarded for high integrity marking;
3. Marks are moderated by staff so that deviations from staff marks need to be justified;
4. Blind peer marking is used as a check;
5. Random staff marking is used as a check;
6. A major goal is the achievement of effective self-assessment and students have had ample opportunity to practice and develop their skills;
7. The criteria against which achievement is to be judged have been sufficiently un-ambiguously defined for there to be little scope for misinterpretation of grade boundaries;
8. Effort is explicitly excluded as a criterion.

2.4.3 Reliability and validity of approach

When introducing a new type of assessment procedure into a curriculum, issues needing consideration are the reliability and validity of the procedures. Reliability can be described as the degree of consistency between measures of the same thing (Cohen *et al.*, 2000). As has been shown in the previous section, although reliability in peer and self-assessment is not necessarily a given, strategies can be implemented to improve it. The extent to which student-generated grades are used, however, would depend on the objective of the exercise. In many studies, the real value of peer and self-assessment may not necessarily be in the recording of grades, but rather in the experience students gain with regards to becoming more autonomous learners, as is the case in this study.

The term validity is used to describe the extent to which an assessment procedure assesses what is intended to assess (Cohen *et al.*, 2000). For a test to be valid, the grades must be reliable, but reliability is not necessarily sufficient to claim validity.

There are two types of validity that are of concern here. *Content validity* refers to when assessment reflects the content and balance of what has been taught and *construct validity* refers to the extent the assessment procedure tests what it sets out to test and not something else (Curry, 1986). Traditional forms of assessment, which emphasise memorisation, are often favoured as they can demonstrate fairly high content validity. Furthermore, traditional testing procedures may achieve construct validity, but usually only with respect to lower order skills such as recall of factual information. They are usually weak in construct validity with respect to higher order skills such as

skills of analysis and synthesis and in the affective domain such as motivation, feeling, initiative, and social and moral values (Curry, 1986).

By using assessment criteria that closely match the learning objectives of the course, construct validity can be improved (Benett, 1993). Therefore peer and self-assessment procedures, which necessitate the writing and sharing of assessment criteria with the students, can have good construct validity, especially if higher order skills and affective areas are considered. Furthermore, by increasing the range of assessment procedures the students are exposed to, through the introduction of peer and self-assessment, content validity may also be increased (Benett, 1993).

2.4.4 Use of criteria

The use of assessment criteria in any teaching situation is important for directing student learning (Loacker & Jensen, 1988). Instead of passively receiving instructions from the educator, students can develop an understanding of the process and as a result take responsibility for their own learning by identifying and applying criteria to assess their own performance. They *learn to learn* which is very empowering.

The aspect of criteria has received much attention in the literature. Boud & Falchikov (1989) indicated that, provided the criteria are discussed and agreed in advance, there is usually good comparison between student and lecturer grade. However, despite achieving fairly reliable grades, Orsmond *et al.* (1996) in their study also revealed that students have different understanding of individual criteria compared with that of the lecturer – despite prior lengthy discussion with the students. Students produced comparable grades on criteria relating to lower order skills such as 'clear purpose' and self-explanatory', but criteria relating to higher order skills such as 'clear and justified conclusion' and 'helpful level of detail' resulted in more variation

In a follow-up to the 1996 study, Orsmond *et al.* (2000) examined the aspect of student-generated criteria. Interestingly, the study showed this did not necessarily enhance agreement between student and lecturer grades compared with when they were provided with lecturer-generated criteria. The explanation put forward is that perhaps students develop 'ownership' – related to the 'meaning' and 'worth' of the criteria in terms of marks awarded. In other words the students are the arbiters of the quality of the criteria expressed (Orsmond *et al.*, 2000). In contrast to the above-mentioned study, another study focusing specifically on collaboratively generated criteria (Stanton, 1978) showed 80% agreement between student and lecturer grades.

Analysis of the different studies focussing specifically on the use of criteria in peer, self- and collaborative assessment show conflicting results. However, a couple of generalisations may be made:

- Student generated criteria tend to emphasise lower order skills (relating to style, structure, layout, readability, clearly written, well presented) and not on higher order skills (eg. quality of thinking, theoretical understanding, ability to synthesise) (Penny & Grover, 1996).
- Terms and phrases may not necessarily have the same meaning to students and lecturers.
- Students have a less well developed 'sense' of criteria and how to judge work based on them (Boud, 1989)

The issue of guidance and support in the assessment process Gibbs (1999) and the influence of social, cultural and political diversity in interpretation (Stefani, 1998), is emphasised

2.4.5 Time-saver?

As with any other skill, students need practice and training in order to develop the ability to assess their own and others performance reliably (Woods et al., 1988). This requires time. However, with decreasing resources and increased diversity in terms of students' abilities, no easy solutions are available. The process of peer and self-assessment should therefore not be viewed as a means of relieving lecturer load in the short term. However, it should ultimately feed back in a positive way to the teaching practice as students become progressively more competent and confident as they develop more autonomy in their learning.

3. RESEARCH METHODOLOGY

3.1 Action research – introduction

Since the researcher wished to improve her own teaching practice as well as monitor the process of student learning, engagement in an action research approach was considered appropriate for this study. Action research has been used for many years in industrial, health and community work settings where an understanding of complex social situations was required in order to improve the quality of life (Riding *et al.*, 2001). Kurt Lewin, who coined the phrase 'action research', used the methodology in his work with people affected by post-war social problems (Lewin, 1948). In the late 1960's and early 1970's action research was brought into the educational setting, with teachers taking on the role of researchers, particularly in the secondary education sector (Riding *et al.*, 2001). Proponents of action research argued that traditional educational research had failed to impact significantly on educational practice (Robson, 1993; Zuber-Skerritt, 1992) and that an effective way of promoting change was through practitioner involvement in the research process. In other words, action research was used as an appropriate and effective means to integrate educational research and teaching practice.

Although it is recognised that action research is a methodology employed by many types of practitioners, the rest of the discussion will refer to action research in the educational context.

3.2 What is action research?

Action research is described by Hopkins (1985: p32) as an informal, qualitative, formative, subjective, interpretive, reflective and experiential model of inquiry in which all individuals involved in the study are knowing and contributing participants. Action research thus provides a framework for qualitative investigations by educators and researchers in the complex classroom or lecture room situation, which has been referred to as the messy 'swampy lowlands' by Schön (1983).

Some of the more widely accepted definitions of action research include the following:

> 'Action research is critical collaborative enquiry by reflective practitioners who are accountable in making the results of their enquiry public, self-evaluative in their practice, and engaged in participative problem-solving and continuing professional development' (Zuber-Skerritt, 1982: p15).

'[Action research] .... is the systematic study of attempts to improve educational practice by groups of participants by means of their own practical actions and by means of their own reflection upon the effects of those actions' (Ebbutt, 1985: p156).

'Action research is a form of self-reflective enquiry by participants in social situations, undertaken in order to improve understanding of these practices in context, with a view to maximising social justice' (Carr & Kemmis, 1986: p162).

The themes that run through these and other definitions are those of *action, reflection participation* and *improvement*. However, the ultimate aim of action research is not always the same, and therefore needs to be articulated. For many (eg. Lewin, 1948; Carr & Kemmis, 1986; Zuber-Skerritt, 1996) the purpose of action research is to improve equality and 'maximise social justice'. This places these authors, and many others, in the critical paradigm, where action research is considered *emancipatory* and is part of the broader agenda of changing society as well as practices within education (Cohen *et al.*, 2000). For others, action research is implemented to bring about practical improvement and innovation (Zuber-Skerritt, 1992; Ebbutt, 1985) and for the professional development of educators (Winter, 1996; Zuber-Skerritt, 1992). The approach of these authors is located better within the interpretivist paradigm in which the aim is some *practical* improvement.

In contrast to the emancipatory and practical interests, action research may also be implemented to improve the effectiveness and efficiency of educational practice, in which case it can be termed *technical* action research and is located within the positivist paradigm as defined by Cohen *et al.* (2000). Carr & Kemmis (1986) feel technical action research is the least powerful and emancipatory action research is the ideal. In contrast Zuber-Skerrit (1992) views the three types of action research as developmental stages, with a technical interest often being the starting point, with a gradual progression to higher levels.

Regardless of the ultimate purpose, the concept of *reflexivity* is central to action research. Whereas technical action research can be regarded as similar to Schön's (1987) reflection-in-action, practical action research can be likened to reflection-on-action and emancipatory action research is based upon critical reflection resulting in a change in the system itself. Furthermore, regardless of philosophical orientation, this *reflective practice* is informed by and informs *theory*,

coined by the term of 'praxis' (Cohen *et al.*, 2000). This distinguishes action research from the everyday reflection of the educator on the teaching process.

In light of the above comments it can be seen that action research is designed to bridge the gap between educational *research* and teaching *practice* (Zuber-Skerrit, 1992). In fact, Bhattacharya *et al.* (2000) place action research on a continuum of educational enquiry, ranging from *feedback* at one end of the spectrum through *formative evaluation* to *action research*, with '*full educational research*' at the other end. Obtaining *feedback* from students about current teaching and learning is usually fairly informal and can illicit a response that allows those who provide the feedback to benefit from the changes made. *Formative evaluation* tends to be more formal and rigorous than feedback and leads to the benefit for the following cohort of students. It is usually based on curriculum development. In contrast, *action research* can focus on the nature of learning and teaching, usually within a specific context, where following cohorts benefit. Initially the findings of the study may only be relevant to the particular situation, but with using systematic enquiry and sound methodology within a theoretical framework this may be extended (Bhattacharya *et al.* 2000). Emerging ideas can be checked in practice and these may gradually develop into a critical educational theory (Zuber-Skerrit, 1992).

The above three forms of educational enquiry require the practitioners themselves to be directly involved. At the other end of the spectrum, *full educational research* is an investigative activity, with the researcher usually a 'detached agent', that produces and justifies generalised conclusions and recommendations (Bhattacharya *et al.*, 2000).

3.3 Action research design

The essential components of action research design can be summarised in a spiral of planning, action, observation and reflection (Figure 3.1). It is recognised, however, that the stages may overlap and that the process is more often fluid, open and responsive than the spiral diagram reflects (Kemmis & Wilkinson, 1998). Nonetheless, for convenience the process is discussed under these four stages.

Figure 3.1: Action research cycle of planning, acting, observing and critically reflecting.
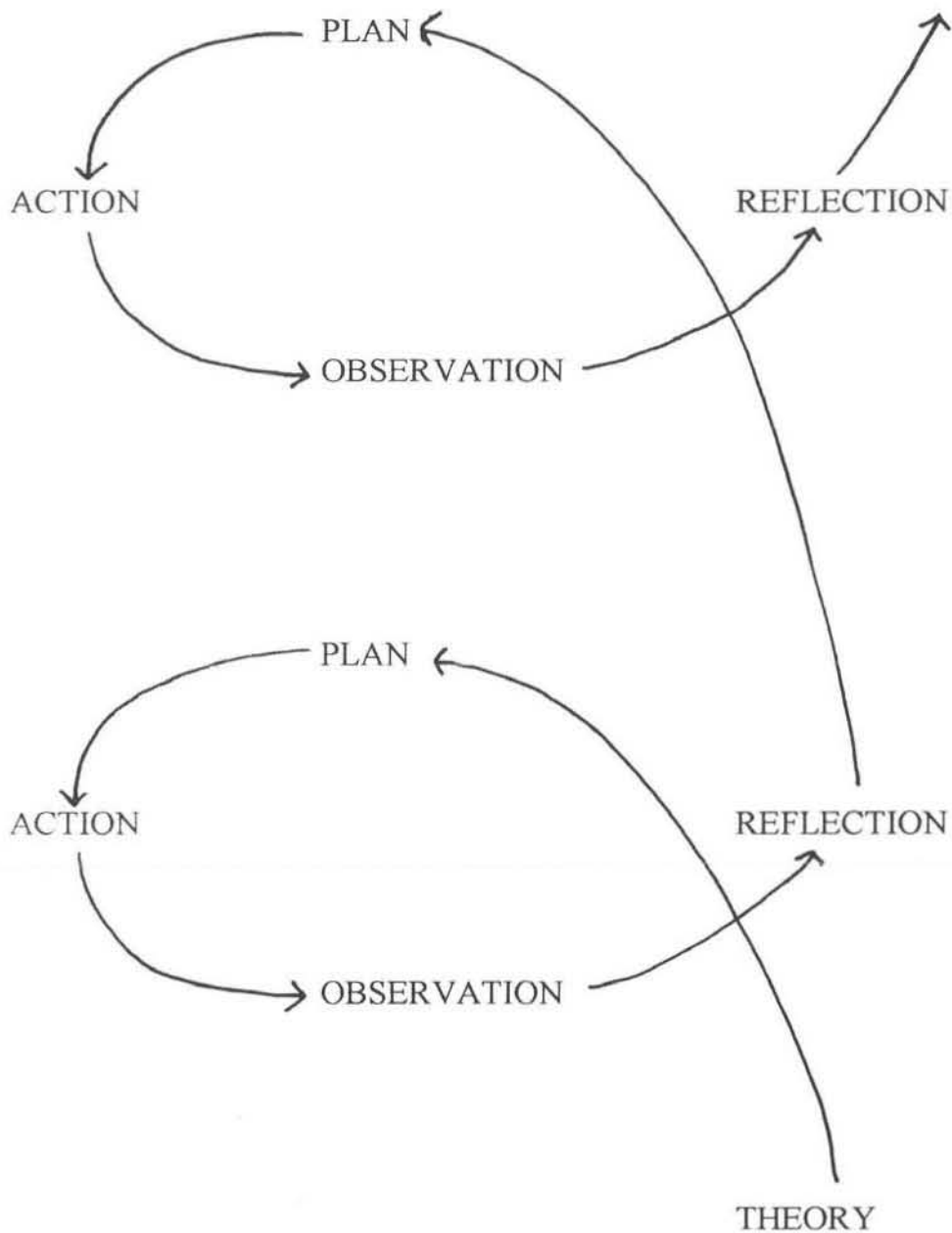
The *planning* phase is the exploratory phase, where a problem in the educational setting is identified and an understanding of the problem is developed, based on theory in the literature and ideas and thoughts from discussions with interested parties. An intervention strategy is planned through consideration of the research procedures that will be followed, and assumptions underlying the study are made explicit (Cohen *et al.*, 2000). The *action* phase is where the intervention is carried out. It is deliberate, controlled and aim-oriented (Zuber-Skerritt, 1992). The *observation* phase has the function of documenting the action process and the effects of the action. Based upon the observations and outcomes of the intervention, there is a phase of critical *reflection* where new and/or revised intervention strategies are planned. Discussion among participants and practical and

theoretical discourse can aid and guide the reflection (Zuber-Skerritt, 1992). It should be said, however, that the distinction of a specific *reflection* phase as one of four phases is perhaps slightly misleading as reflection generally occurs at all stages throughout the process.

The four stages of action research form part of an iterative procedure which is intended to foster a deeper understanding of a given situation as well as improve practice. In the earlier models of action research the purpose was to close in upon a final goal or outcome by repeated iterations (MacIsaac, 1996). Later models, however, recognise that goals will necessarily change throughout the process. This is reflected by the use of spiral rather than circular diagrams (Figure 3.1).

3.4 Possible problems associated with action research

Despite the benefits the notion of reflexivity brings to the research process, the researcher also needs to be aware of some of the problems. As Cohen *et al.* (2000: p239) state reflexivity requires 'a self-conscious awareness of the effects that the participants-as-practitioners-and-researchers are having on the research processes, how their values, attitudes, perceptions, opinions, actions, feelings etc. are feeding into the situation being studied'. The participants-as-practitioners-and-researchers need to critically scrutinise their own interpretations in this light.

Furthermore, action research is underpinned by democratic principles such as a participatory approach, consensual decision-making, shared values and goals, shared ownership of decisions (Cohen *et al.*, 2000). For action research to be successful an environment in which democratic processes are encouraged needs to be in place.

Practical considerations for action research are that the extent of the research needs to be limited as the researcher is usually required to do the research at the same time as the normal work. In addition, there is a fine line between doing research that is too minimal to lead to genuinely new insights, or too elaborate to be feasible (Zuber-Skerritt, 1996).

3.5 Action research in this study

The main aim of this study was to broaden and improve the students' learning experience. It was (and still will be in the future) conducted participatively with the lecturer (myself), the students and tutors, and in a reflective and iterative fashion. The design and implementation of the present study conforms to the action research spiral of planning, action, observation and reflection. A *very brief* summary of the process is presented in Figure 3.2 to highlight the different phases, but details follow in the methods section (chapter 4).

Figure 3.2: A summary of the action research cycle pertaining to this study.

PLAN
(f) - write three new tutorials
(addressing criteria)

ACTION
(g) - ditto (c)

OBSERVATION
(h) - ditto (d)

REFLECTION
(i) - teaching context important
- need to be more critical in future
- need less intimidating process
for students

PLAN
(b) - write tutorial addressing criteria
- plan peer and self-assessment
activities

ACTION
(c) - students participate in tutorials
- self- and peer assessment centred
around test

OBSERVATION
(d) - evaluation of procedure through:
- student evaluation
- lecturer marking and comment
- interviews

REFLECTION
(e) - students need better understanding
of criteria
- comments from other staff required

THEORY
(a) integrating assessment
into learning – encourages
a deep approach to learning

3.6 Location of study within a research paradigm

The practice of educational research can be viewed through three different lenses: (a) positivist or scientific methodologies, (b) interpretivist methodologies and (c) methodologies of critical theory (Cohen *et al.*, 2000). The positivist approach is based on the philosophy of realism, draws on empirical-analytical research methodologies used in the natural sciences, and usually has a technical interest. In contrast the interpretivist and critical theory approaches are based on the philosophy of idealism and seeks to understand actions and meanings rather than causes, although the latter has an emancipatory interest and thus a transforming component. The interest in the interpretivist approach is usually practical (Cohen *et al.*, 2000).

Using an action research framework, the general approach to the study was to gather a range of data in various forms from a fairly large group of students (76 students in 2000 and 91 in 2001). Some data was of a quantitative nature in the form of assessment grades of both the students and the lecturer. Qualitative data was also collected in the form of student feedback comments, answers to closed- and open-ended questions in student evaluations and individual comments from student and tutor interviews.

In terms of identifying the particular paradigm in which the study can be located, the following issues are important:

- The aim of the study is:
  - practical, in terms of attempting to improve students' approach to learning by broadening their assessment base.
- The approach of the study is:
  - descriptive (rather than prescriptive or predictive);
  - holistic – to try and gain insight and understanding of student learning in a natural setting (rather than in an experimental, reductionist fashion);
  - triangulatory – using a broad range of data sources, in recognition that causation is likely to be multi-dimensional;
  - to focus and gain insight on a group of individuals (rather than collect a wide range of data and identify trends);
  - for the researcher to participate actively in the process.

Although there are elements of this study which can be located within both the positivist and the critical theory paradigms, most factors locate this study within the interpretivist paradigm.

4. METHODS

4.1 General approach

This study was conducted with participation of students from the Environmental Geography 1 class, a first year Geography module offered in the second semester. Seventy-six students were involved in the first iteration and 91 in the second, with each iteration being broken down into a number of stages.

4.1.1 First iteration (Year 2000)

Stage 1 – Discussion of criteria used for marking essays

Students regularly participate in weekly tutorials in which skills are taught. A set of (previously negotiated) marking criteria were discussed with the Environmental Geography 1 students during a tutorial in which they were writing an essay. Issues such as what constituted a good *introduction* and *conclusion*, what components of *style* (good paragraph construction, logical flow and coherence *etc*) and *content* (relevance of material, focus on topic, use of examples and diagrams *etc*) were argued. The following week each student received written feedback on their essays in the form of comments and a grade from the tutor on each of the four categories of introduction, conclusion, style and content. Half of the marks were for content and the remainder for style, layout and presentation. There was a general discussion about the most common problem areas that the tutor encountered in the student essays.

Stage 2 – Preparation for peer and self-assessment process

The students wrote a test (Appendix 1) in the fifth week of the semester. They were informed in advance of the test that there would be a paragraph question (choice of two topics) worth 10 marks and a short essay worth 30 marks. They were also informed they would be required to estimate, immediately prior to the test, based on the quantity and quality of work they had put into preparation, the grade they thought they deserved. Immediately after the test they would be required to estimate the grade they thought they had achieved. Based on the same criteria that had been discussed and used in the tutorials, they would also be marking their own work at a later date.

At this stage, some time was spent getting the students on board and familiar with the process of peer and self-assessment. It is recognised that there tends to be resistance to peer and self-assessment, largely because it is a new and unfamiliar concept (Woods *et al.*, 1988). In order for peer and self-assessment to be a useful process students need to be motivated to participate fully as well as be willing to reflect on their own learning process. The reasons for doing self-assessment,

from a student's point of view were spelled out to the students. The fact that they were participants in a research process was also raised (see section 4.4).

Stage 3 - Peer and self-assessment process

The students wrote the test during a lecture period and the practical period the following day was used for the assessment exercise. During the practical the students participated in three separate activities.

Peer assessment:

Students were provided with an essay that had been written by a student in the final exam the previous year (Appendix 2). The essay topic was based on material they had learned for the test, so it should have been familiar to them. Using a criteria sheet with questions relating specifically to the introduction, conclusion, writing style and content and a model answer (Appendix 2), they were required to mark the essay. It was emphasised that the model answer should only be used as a guideline, as essay answers can take on many different forms. The model answer rather served to highlight the *type* of information that was required in the answer. Their assessment of the essay entailed writing comments (providing feedback) as well as awarding a grade. Their comments and grades were discussed in some detail with their tutor before moving on to the next activity. Tutors marked and provided written feedback to individual student assessments. These were returned the following week.

Self-assessment:

The second activity entailed assessing their own test (feedback and a grade), again using the criteria sheet and model answers (Appendix 1). Since this was a first attempt at self-assessment for the majority of students, it was felt that grades they awarded could not be used for accreditation purposes. However, in order to ensure good participation in the exercise, students would later receive a grade for their own assessment (in other words, the lecturer graded the *test* as well as the *self-assessment process*). The lecturer suggested that the grade for self-assessment be 10% of the total mark, but students negotiated a figure of 20%. This may suggest a sense of enthusiasm for the process, although it is possible that the students felt they would be able to score better in the self-assessment than in the test itself. This was not necessarily the case.

Evaluation:

The third activity was the completion of a questionnaire in which their perceptions of the process were evaluated (Appendix 3). Student numbers were provided on a voluntary basis. The rationale for the design of the evaluation is provided in section 4.2.3.

Stage 4 – Lecturer feedback

The lecturer marked the test as well as their self-assessment – giving feedback and a grade for both. Documentation was collected during this stage. The tests were returned to, and discussed with, the students within a week.

Stage 5 –Informal interviews.

A number of students who had performed poorly in the self-assessment exercise were interviewed by the lecturer in an unstructured fashion. Strategies for improving performance were suggested and self-reflection was encouraged. An informal record of discussions was kept. The rationale for this interview approach is discussed in section 4.2.4.

4.1.2 Second iteration (Year 2001)

Critical reflection on the relevant teaching interactions and on the peer and self-assessment exercises revealed certain problems that needed addressing. Details of the changes made are outlined in the following sections (4.2). In summary, the second iteration followed the same stages as the first. However, since it was felt that students had had insufficient preparation for self-assessment and a poor understanding of criteria, new tutorials were implemented in 2001 which addressed these issues (see sections 4.2.1 and 4.2.2). Furthermore, in the second iteration tutor's and teaching staffs' comments were actively sought, the evaluation was restructured (section 4.2.3) and detailed notes were made during the interviews (section 4.2.4) and there was a change in the mark breakdown for the process (section 4.2.5). The test the students wrote is in Appendix 4.

4.2 Practical considerations for both iterations

4.2.1 Teaching interactions

In the first iteration the issue of essay writing and criteria used for assessing essay writing were addressed in a rather informal way during the tutorials preceeding the peer and self-assessment exercises. Results from, and reflection upon, the first iteration revealed that students had a poor understanding of the criteria used in the assessment process. In an attempt to overcome this

problem three new tutorials were designed in which writing skills and assessment criteria were specifically encountered.

In the first tutorial criteria for good essay writing were presented (Box 1 in Appendix 5). Based on the criteria relating to the introduction and conclusion sections of an essay, students were expected to comment on a number of different introductions and conclusions that had been provided. This served the double purpose of exposing students both to peer assessment as well the concept of using criteria for assessment. The students were also required to write their own introduction and conclusion based on what they had learned.

The second tutorial focussed on essay planning, in which issues of structure and style are addressed (Appendix 6). The third tutorial attempted to build upon the previous two tutorials as students were required to plan and write an essay, focussing on the criteria from the first tutorial (Appendix 7).

4.2.2 Criteria selection and criteria sheet design

In both iterations the choice of criteria used in this study were based upon teaching interactions that had preceeded the peer and self-assessment exercises. In the first iteration discussions with the students raised issues such as 'what constitutes a good introduction?', or 'how many ideas should there be in a paragraph?'. These formed the basis for the criteria marking sheets (Appendix 1). In the second iteration the criteria used in the peer and self-assessment exercises (Appendix 4) were slightly different from those used in the first iteration, but were identical to those outlined in their first tutorial (Appendix 5).

In both years the criteria were phrased in question form which compelled students to provide an answer. The students were given the option of providing their feedback comments either on the script itself (in a different colour) or in the allotted space on the criteria sheet (Appendix 1, 2, 4).

Although it was recognised that written feedback would provide a good indication of students' perceptions of their own or a peer's work, it was felt that asking them to award a grade would add a different dimension. This allowed for quantitative comparisons between grades they awarded with those of the lecturer. However, the researcher was aware that student grading in itself raises issues such as whether students are competent to award grades and whether awarding of grades changes the dynamic of the exercise. These issues are discussed more fully in the final discussion chapter.

4.2.3 Design of evaluation form

Both open and closed questions were asked in the evaluation. Although closed questions do not allow for additional comments, they are quick to complete and easy to process (Cohen *et al*, 2000). The students were limited to a three-point rating system (agree, neutral and disagree) in their responses to the closed questions in this study (Appendix 3). In both iterations of the evaluation it was considered important to ascertain, using closed questions, whether students felt the test was fair and was what they expected. If students *had* perceived the test as unfair and unexpected, it is unlikely that they would have participated fully and willingly in the peer and self-assessment exercises and the results of the study would have needed to be interpreted in this light. The other closed questions in the first iteration, relating to usefulness of criteria and model answers, were helpful but it was felt the range of questions, in general, was rather limiting (Appendix 3). In the second iteration closed questions relating to students' feelings of confidence, motivation and attitude towards learning were also included, as were some biographical questions (Appendix 8).

Although open-ended questions can result in 'messy' data that is difficult to process, such questions may reveal information that may not have even been considered in the closed questions. As stated by Cohen *et al*. (2000: p255) 'open-ended questions can catch the authenticity, richness, depth of response, honesty and candour which …… are the hallmarks of qualitative data'. Consequently open comments were invited in both iterations. In addition, the second iteration also had the more directed, but still open question, of what they liked *best* and *least* about the self-assessment exercise. Furthermore, biographical information on gender and home language was sought in an effort to help to explain some of the observed trends.

The evaluation was done immediately after the peer and self-assessment exercises, during formal teaching time. It is recognised that this did not give students an opportunity to reflect on the process, and the answers were interpreted in this light. However, it did mean that all students completed the evaluation form which obviated the problem of getting poor returns.

4.2.4 Interviews

The anonymity in the above-mentioned evaluation would have rendered a fair element of honesty which may not always be present in one-on-one interviews. However, since the 'lecturer' in this study is the academic development person in the department, most of the students interviewed were already known to the lecturer and a good rapport had been developed with them. Cohen *et al*

(2000) recognise developing rapport as a crucial stage in the interview process. It is felt this contributed enormously to open and honest interaction.

The lecturer spoke individually to a number of students that had done poorly in the self-assessment exercises (twelve in the first and nine in the second iteration). It was recognised this was a purposive sample and not representative of the whole group. However, it was felt that this particular group of students would provide the insight needed to better understand the problems students have with such exercises.

In the first iteration the interviews were conducted in an unstructured fashion, with the questions relating directly to the feedback given by each individual student. For example, if it was obvious a student had a different understanding of a particular criteria compared with the lecturer, this was specifically discussed. Although data attained in unstructured interviews is more difficult to analyse (Cohen *at al*, 2000) it was felt unlikely that a more structured approach would be as responsive and would reveal such rich data. The second iteration was therefore conducted in a similar fashion, except answers were documented in writing during the process of the interview.

4.2.5   Mark breakdown

Since students generally lack experience in awarding grades, the student-derived grades were not used for summative purposes in the first iteration. However, Boud (1989) indicates that the use of student-derived grades can encourage fuller participation in the process. It was for this reason that this component was included in the second iteration. The breakdown of marks for the two iterations is in Table 4.1.

Table 4.1: Breakdown of test marks for each iteration.

	Lecturer grade for test	Lecturer grade for student self-assessment	Student self-assessment grade
Iteration 1	80%	20%	
Iteration 2	80%	10%	10%

4.3 Mixing methods: triangulation

A summary of the different exercises included in the study, as well as the different types of data collected from each exercise, is presented in Table 4.2 below. In recognition that working with a large group of students with diverse cultural and educational backgrounds may reveal diverse and 'messy' data, a multi-pronged approach was used. Data was collected using a *range of methods* (student assessment exercises, student evaluation, student interviews, tutor interviews and formal and informal self-evaluation), a *range of data types* (quantitative, qualitative; formal, informal; open questions, closed questions), a *range of sources* (students, tutors and self), as well as information from *two different occasions* (years 2000 and 2001). This multi-pronged approach, referred to as triangulation, is recognised as a useful means of generating reliable, authentic and more valid data (CVCP/USDA, 1992) and that it helps explain more fully the complexity of human behaviour by studying it from more than one standpoint (Cohen *et al*, 2000). It was for these reasons that triangulation was used in this study.

Table 4.2: Summary of exercises done and type of data collected during the study

EXERCISE	QUANTITATIVE DATA	QUALITATIVE DATA
Pre-test estimate of grade	Grade estimate	
Post-test estimate of grade	Grade estimate	
Assessment of peer essay	Grade	Written feedback
Assessment of own paragraph	Grade	Written feedback
Assessment of own essay	Grade	Written feedback
Lecturer assessment for self-assessment	Grade	Written feedback
Lecturer assessment for test	Grade	Written feedback
Student evaluation	Responses to closed questions	Open-ended comments
Tutor feedback (year 2001)		Open-ended comments
Informal interviews		Solicited and unsolicited opinions
Informal critical reflection		Ideas and draft report

4.4 Ethical considerations

Much educational research necessitates obtaining consent and co-operation of those involved in the research process which, in the case of this study, was the learners themselves. In their

comments on obtaining informed consent, Frankfort-Nachmias & Nachmias (1992, in Cohen *et al.*, 2000: p50), raise the issue of risk:

'The principle of informed consent should not be made an absolute requirement of all social science research. Although usually desirable, it is not absolutely necessary to studies where no danger or risk is involved. The more serious the risk to research participants, the greater becomes the obligation to obtain informed consent.'

There was no real risk for students in the present study and in fact the study was implemented to improve the student learning environment and students were likely to benefit in one way or another. Furthermore, the changes in the curriculum were normal changes that could have taken place in any dynamic teaching environment. On this basis informed consent was not necessarily a requirement. However, on ethical grounds, it was considered important that students were aware of and accepted the fact that they were subjects of research. (Kelly, 1989) suggests that one needs to be particularly careful about ethical considerations in an action research project such as this one as the boundaries between research and practice are blurred. Participants may well be unaware when their comments and/or actions are being documented and utilised by a researcher.

In this study the research process was described to the students in some detail prior to starting the study. Issues (as outlined by Cohen *et al.*, 2000) such as (a) why the research was being carried out, (b) the direct and indirect benefits of the research to themselves and to later students, (c) guarantees of anonymity and confidentiality, (d) who would see the research, and (e) opportunities to see and comment on a draft before finalisation of the report, were raised.

In both years students responded positively, and in fact many expressed pleasure at being involved in a research study. As one student put it: 'Now we feel *really* useful'! During both iterations draft copies of the report were posted on their notice board and a number of students read them, but no comments were volunteered.

On the evaluation form student numbers were requested on a voluntary basis. It was explained this information was to be used for cross-tabulation. The majority of students provided their number, although it was interesting to note, although perhaps not unexpected, that those not supplying their student number were the students who felt most negatively about the process.

The tutors were also informed in a similar manner as the students, and were also willing participants. One provided comments on the draft report and these have been incorporated into the final thesis.

4.5 Data analysis

There were 76 and 91 students in each year respectively, a sample considered sufficiently large for quantitative analysis. The quantitative data obtained (grades and grade estimates) in a number of the exercises were therefore used for correlative comparisons to determine whether there was a relationship between two variables (for example between student-derived grades and lecturer-derived grades). The qualitative data was then used to provide more personal and individual insights into the trends observed from the quantitative data.

The answers to closed questions in the evaluation were analysed in a semi-quantitative manner using frequency distributions. However, again the open-ended comments provided additional and equally valuable insight into student perceptions on the process. These also served to modify and affect the lecturer's own reflections on the process.

Since this was an action research project, the reflections of the lecturer were utilised extensively to guide the process. The nature of these reflections were not easily quantified, but a record of them emerges throughout the project. As mentioned in the Research Methodology section, the researcher was also continually mindful of the fact that her own values, attitudes, perceptions, opinions, actions and feelings *etc* (Cohen *et al.*, 2000) were influencing the process.

5. RESULTS

5.1 Student participation

Overall students participated willingly and constructively in the process despite the lecturer's expectations of some negativity in the peer and self-assessment exercises. In fact, the three practicals preceeding the peer and self-assessment exercises in the second iteration had required many complex calculations and difficult data manipulation, and students sentiments were encapsulated by the comment of one: '*at least we can read and write for a change'*.

5.2 Comparison of student estimates and grades with lecturer grades

Although the task of providing estimates of grades before and after the test invoked anxiety in some students, most of them attempted this exercise. The grades the students estimated (a) prior to the test, (b) after the test, as well as the grades they awarded (c) during the self-assessment exercise, were all compared with the final grade the lecturer awarded for the test. In the first iteration the correlation between the lecturer grade and pre-test estimate was poor ($R^2 = 0.164$, $p = 0.003$ – not significant at 99% level; Fig 5.1). This correlation improved slightly in the post-test comparison ($R^2 = 0.273$, $p < 0.001$ – significant at 99% level; Figure 5.2) and even more when the lecturer grade was compared with the student self-assessment grade ($R^2 = 0.436$, $p < 0.001$ – significant at 99% level; Figure 5.3). Despite poor correlations in the second iteration, the same trend of increasing R^2 values with each exercise was evident ($R^2 = 0.050$, Figure 5.4; $R^2 = 0.124$, Figure 5.5; $R^2 = 0.195$, Figure 5.6)

The 1:1 line on the scattergraphs represents the situation where the student estimate or grade exactly matches the lecturer grade. Points above the 1:1 line represent student over-estimation and points below the line represent student under-estimation of grades compared with that of the lecturer. Interestingly there was a general tendency in the first iteration for students to under-estimate their grades (Figures 5.1, 5.2 and 5.3) and in the second iteration to over-estimate grades (Figures 5.4, 5.5 and 5.6). The points on the graph outside the 10% range of the 1:1 line (outside the dotted lines) are an indication of the extent to which students have differed from that of the lecturer. In this regard the over-estimation in the second iteration was quite marked (Figures 5.4, 5.5 and 5.6). This is examined in more detail in section 6.2.

It is also useful to compare the slope of the derived line with that of the 1:1 line. The portion of the derived line below the 1:1 line indicate under-estimation, and visa versa. In all the scattergraphs

Figure 5.1: Lecturer grade versus student pre-test estimate (first iteration)

$y = 0.3323x + 38.539$
$R^2 = 0.1644$
p=0.003 (not significant)

Pre-test estimate (%)
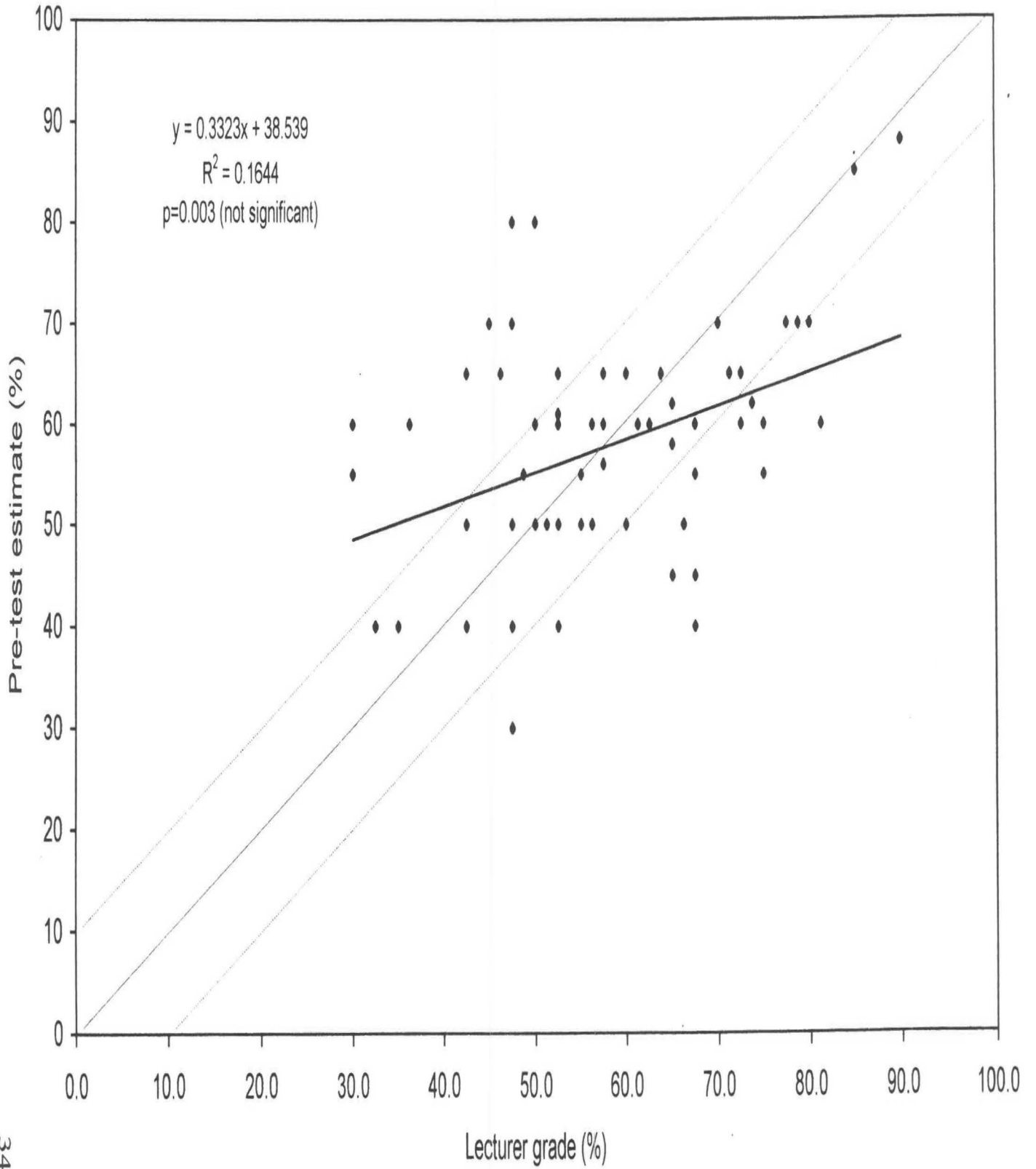
Lecturer grade (%)

Figure 5.2: Lecturer grade versus student post-test estimate (first iteration)

$y = 0.4596x + 27.944$

$R^2 = 0.2733$

$p < 0.001$ (significant)
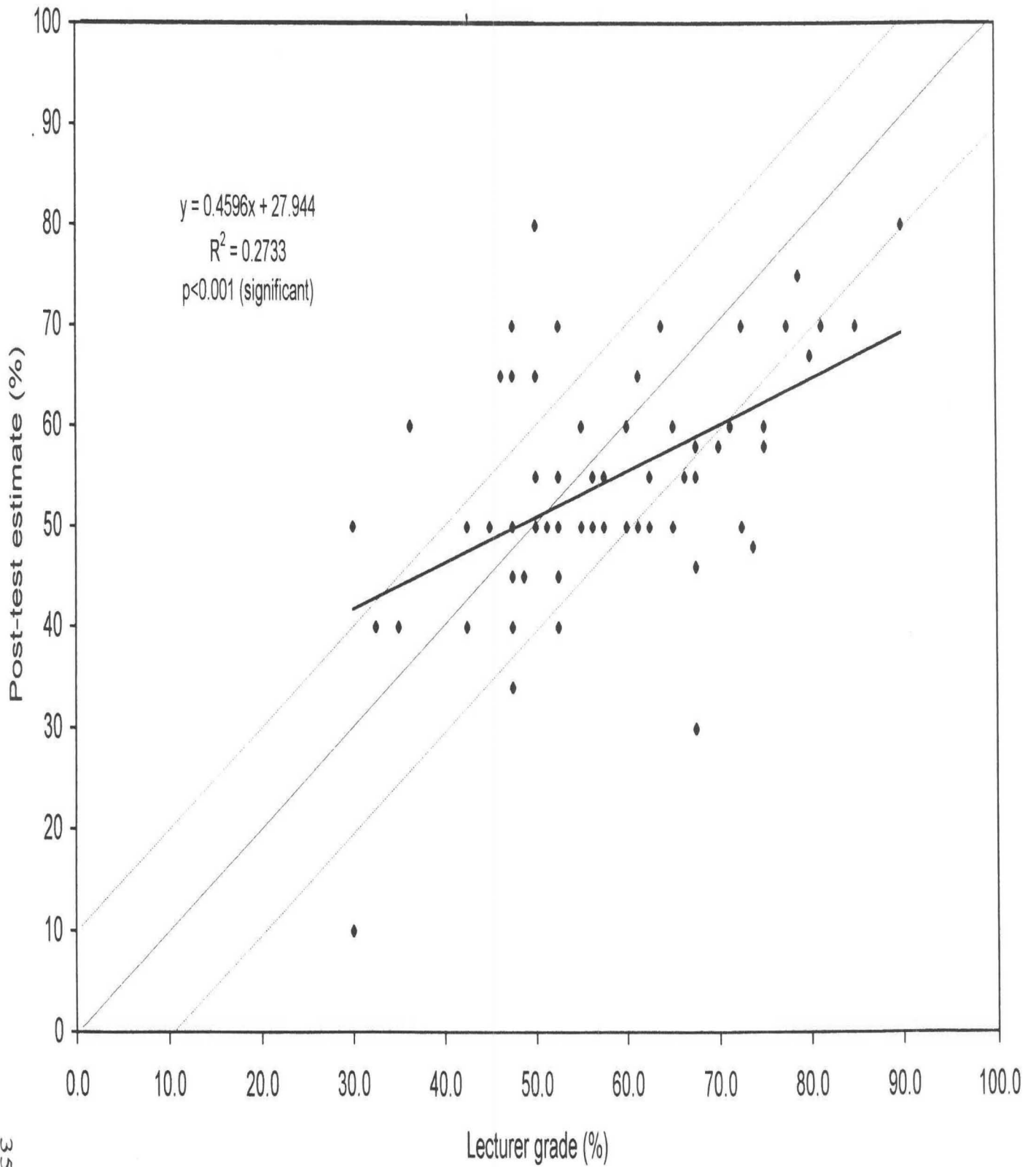
Figure 5.3: Lecturer grade versus student self-assessment grade (first iteration)

$y = 0.5487x + 28.871$

$R^2 = 0.4356$

p<0.001 (significant)

Self-assessment grade (%)
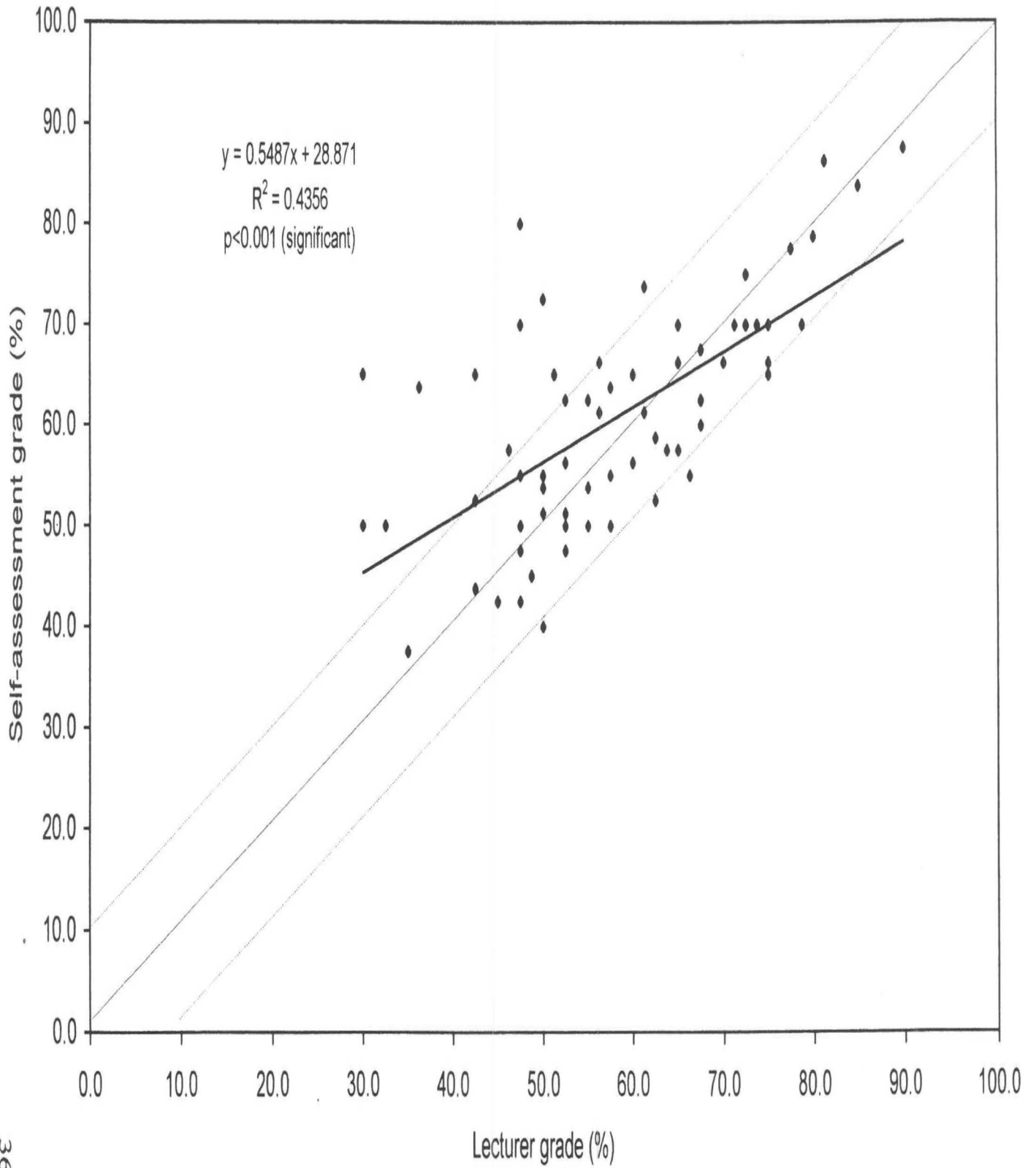
Lecturer grade (%)

Figure 5.4: Lecturer grade versus student pre-test estimate (second iteration)

The chart shows:
- Y-axis: Pre-test estimate (%)
- X-axis: Lecturer grade (%)
- $y = 0.1986x + 51.763$
- $R^2 = 0.0502$
- $p=0.5$ (not significant)
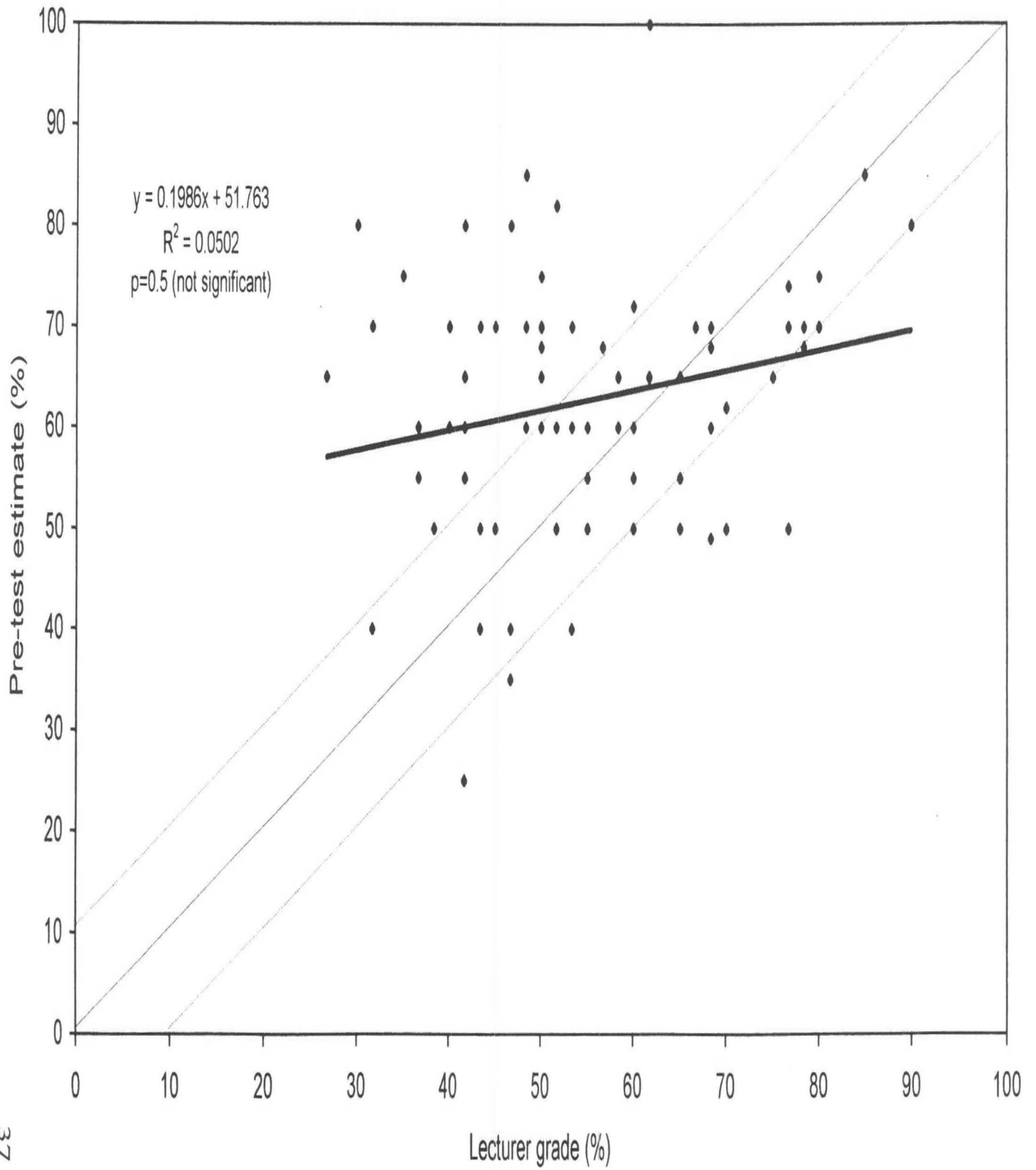
Figure 5.5: Lecturer grade versus student post-test estimate (second iteration)

y = 0.3194x + 42.534
R^2 = 0.1235
p=0.002 (not significant)

Student grade (%)
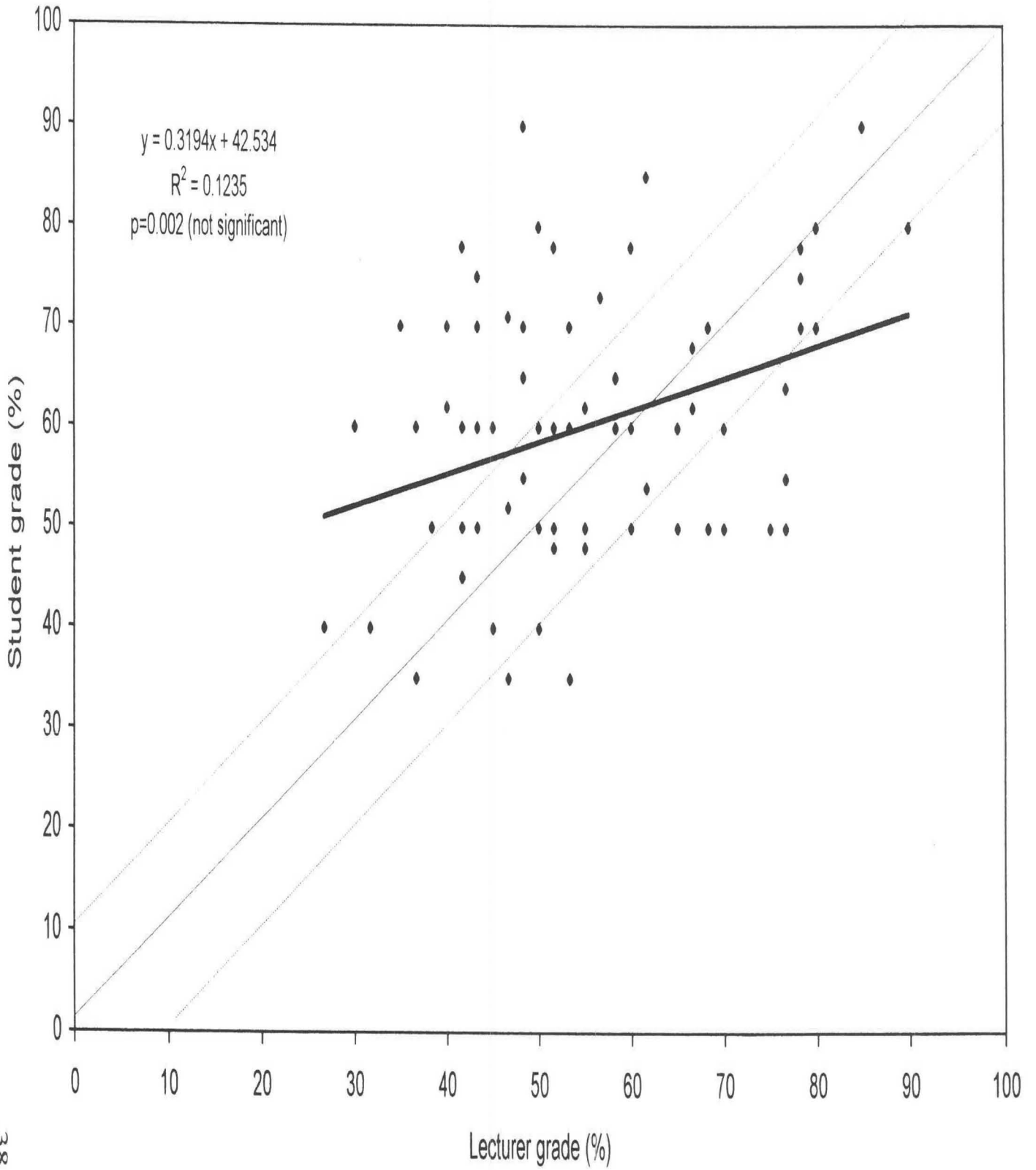
Lecturer grade (%)

Figure 5.6: Lecturer grade versus student self-assessment grade (second iteration)

$y = 0.3557x + 43.94$

$R^2 = 0.1946$

$p < 0.001$ (significant)

Self-assessment grade (%)

Lecturer grade (%)
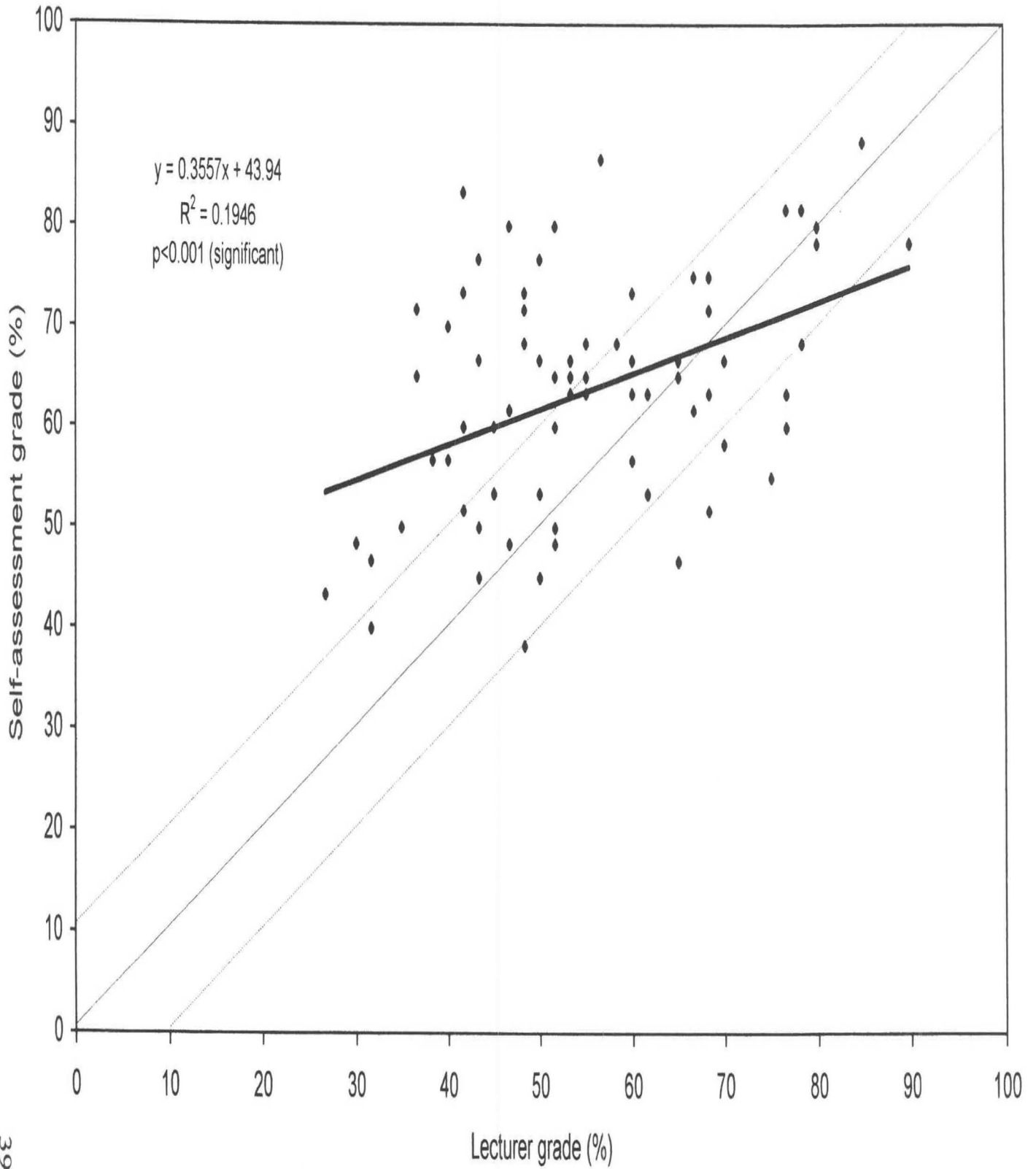
(Figures 5.2, 5.2 and 5.3 – first iteration; Figures 5.4, 5.5 and 5.6 – second iteration) the high achieving students tended to under-estimate their grades and low achieving students showed a tendency to over-estimate their grades.

5.3 Comparison of peer and self-assessment grades with lecturer grades

Individual student-awarded grades in the peer and self-assessment exercises were compared with lecturer-awarded grades. The bar graphs in Figure 5.7 indicate the extent to which student grades varied from lecturer grades in the first iteration, with zero representing when students either awarded the same mark or one above or below the lecturer. The negative values indicate under-marking and the positive values over-marking. Figure 5.7a indicates that students were generally stricter than the lecturer when providing grades for an essay written by a peer and not many students awarded the same marks as the lecturer. In comparing the peer assessment marking of an essay (Figure 5.7a) with that of self-assessment of an essay (Figure 5.7d) there was an interesting trend of under-estimation for the peer assessment and over-estimation for self-assessment when compared with the lecturer grades. A fair number of students, however, awarded the same grade in the self-assessment as did the lecturer.

A comparison of self-assessment of the essay (Figure 5.7d) with self-assessment of the paragraph component of the test (Figure 5.7g) show that student grades were closer to those of the lecturer for the paragraph than for the essay question. Since essay marking is more complex, as it takes into account issues such as writing style as well as content, a breakdown of these two components of marking is provided in Figures 5.7e and 5.7f respectively. Unexpectedly, many more students awarded the same mark as the lecturer in the *style* component than in the *content* component of the essay. Furthermore, the spread in student grades was greater for the content than the style component when compared with that of the lecturer, with students tending to over-estimate their grade for content.

A similar trend was seen in the peer assessment where grades for style and content were separated out. The grades for style (Figure 5.7b) were closer to the lecturer grade than were those for content (Figure 5.7c). In this case however, students tended to under-estimate the grade for content.

The second iteration revealed a similar trend of students being generally stricter than the lecturer in awarding grades for an essay written by a peer and more lenient when grading themselves (Figures 5.8a and 5.8d). However, in this case the under-estimation of grades for the peer was most marked in the style component of the essay (Figure 5.8b), with many more students awarding similar marks

Figure 5.7: Bar graph showing extent of deviation of student-derived grades from lecturer grades (first iteration). Zero represents students either awarding the same mark or one above or below the lecturer. The negative values indicate under-marking and positive over-marking compared with the lecturer. The value in brackets after each graph title represents the total marks awarded for that particular exercise.
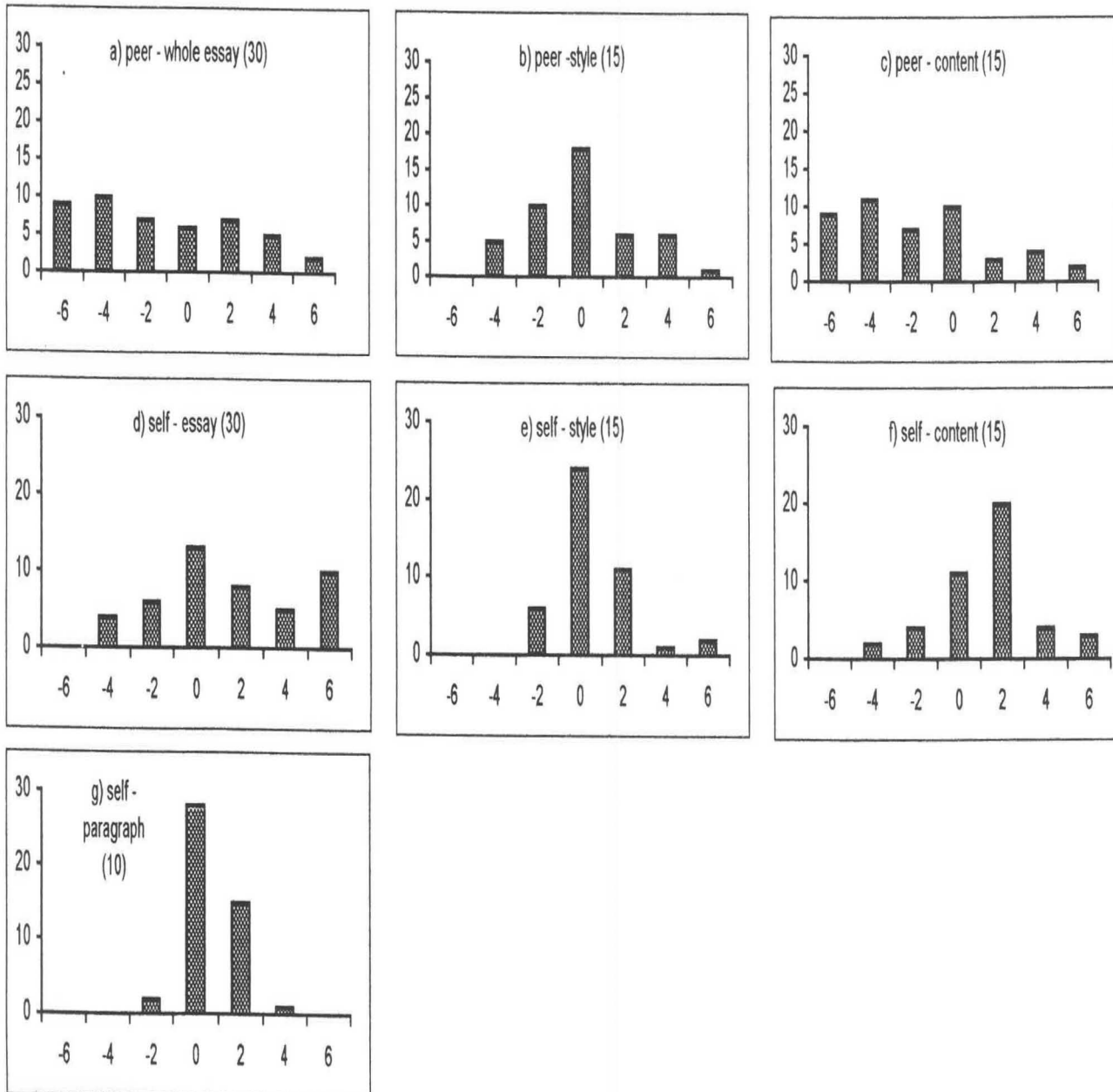
Figure 5.8: Bar graph showing extent of deviation of student derived grades from lecturer grades in the second iteration. Zero represents students either awarding the same mark or one above or below the lecturer. The negative values indicate under-marking and positive over-marking compared with the lecturer. The value in brackets after each graph title represents the total marks awarded for that particular exercise.
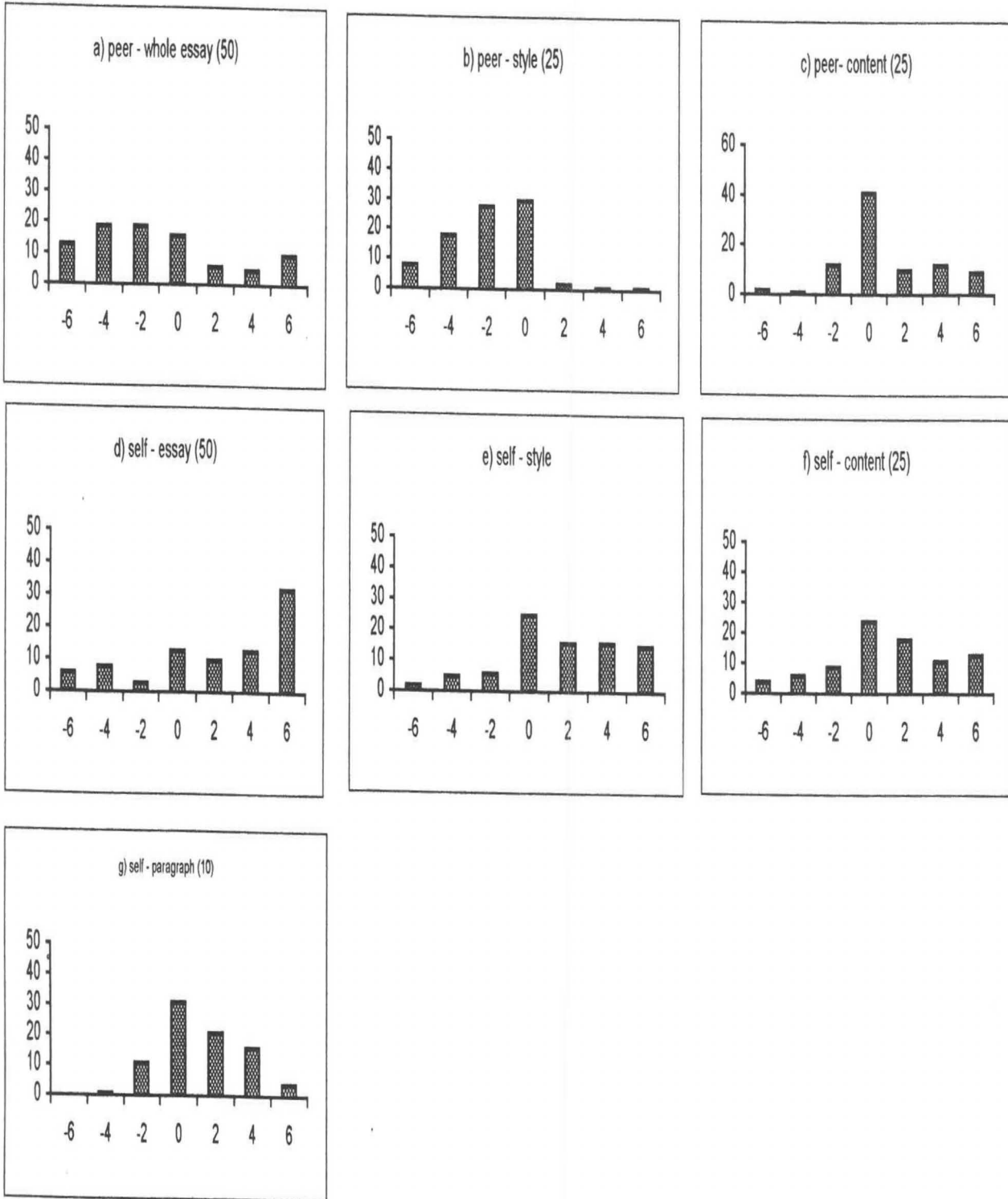
for the content component of the essay (Figure 5.8c). Furthermore, as seen in the scattergraphs (Figures 5.4, 5.5 and 5.6) the overestimation for the self-assessment was more marked in the second iteration, both for style and content (Figures 5.8e and 5.8f), resulting in many students awarding marks way in excess of the lecturer (Figure 5.8d). A similar overestimation of grades was observed in the marking of the paragraph (Figure 5.8g)

5.4 Comparison of lecturer grade for self-assessment and lecturer grade for test

The students were awarded a grade by the lecturer for their self-assessment exercise. The correlation between lecturer grade for self-assessment and lecturer grade for the test in the first iteration was fairly good ($R^2 = 0.740$, $p < 0.001$, significant at 99% level; Figure 5.9) and better than the correlation derived from the previous three comparisons (Figures 5.1, 5.2 and 5.3). Twelve percent of the students received the same grade for the self-assessment procedure and for their test. Thirty eight percent of the students did worse in the self-assessment procedure than they did in the test, and 50% better. Since this grade for self-assessment formed twenty percent of their final mark for the test, the latter group scored higher <u>final</u> grades for the test than they would have had they not participated in the self-assessment exercise.

Although the correlation between lecturer grade for the test and lecturer grade for the self-assessment was fair ($R^2 = 0.471$, $p<0.001$, significant at 99% level; Figure 5.10), and was greater than for the other three comparisons (Figures 5.4, 5.5 and 5.6), it was not as good as in the first iteration. Four students did the same in the test as they did in the assessment, and equal numbers did worse and better.

5.5 Student evaluation of the self-assessment process

The evaluations, on the whole, resulted in generally very positive responses from students. In both iterations students were asked closed questions relating to test and marking procedures (Figure 5.11) as well as to student learning (Figure 5.12 and 5.13). Perhaps the major difference revealed in the closed question responses was that in the first iteration a large majority of students expected the kind of questions asked in the test (Question 1(1), Figure 5.11). In the second iteration almost equal numbers responded positively, neutrally and negatively to this question (Q1(2), Fig 5.11). This has important implications for interpreting differences in trends in the two iterations (see Chapter 6). Otherwise, the responses were very similar in both iterations.

Figure 5.9: Lecturer grade for test versus grade lecturer awarded for self-assessment exercise (first iteration)

$y = 1.016x + 2.5233$

$R^2 = 0.584$

p<0.001 (significant)

Lecturer grade for student self-assessment (%)

Lecturer grade for test (%)
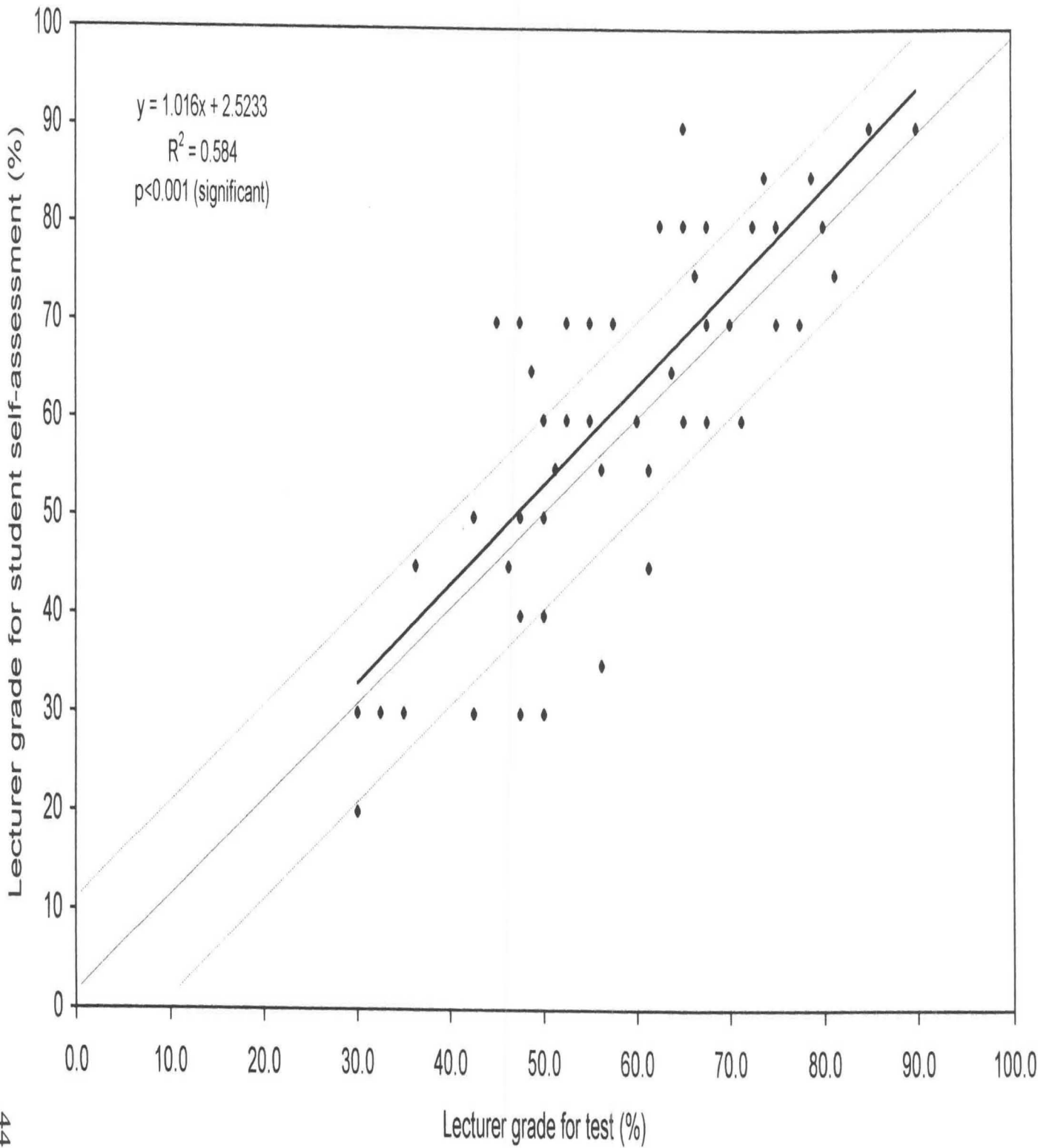
Figure 5.10: Lecturer grade for test vs grade lecturer awarded for self-assessment (second iteration)

$y = 0.919x + 5.1261$

$R^2 = 0.4706$

$p < 0.001$ (significant)
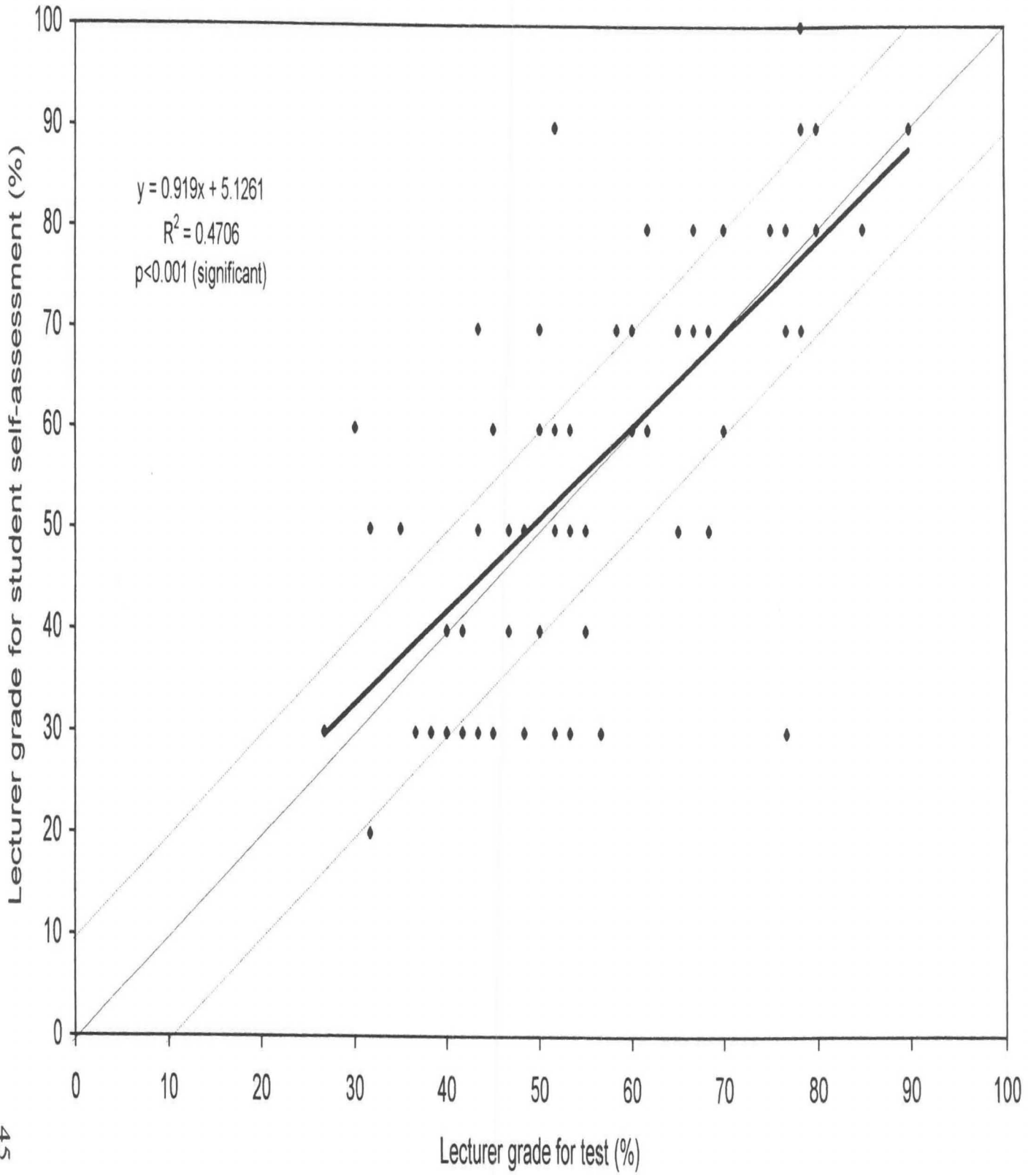
Figure 5.11: Evaluation responses relating to test and marking procedure (brackets indicate iteration)
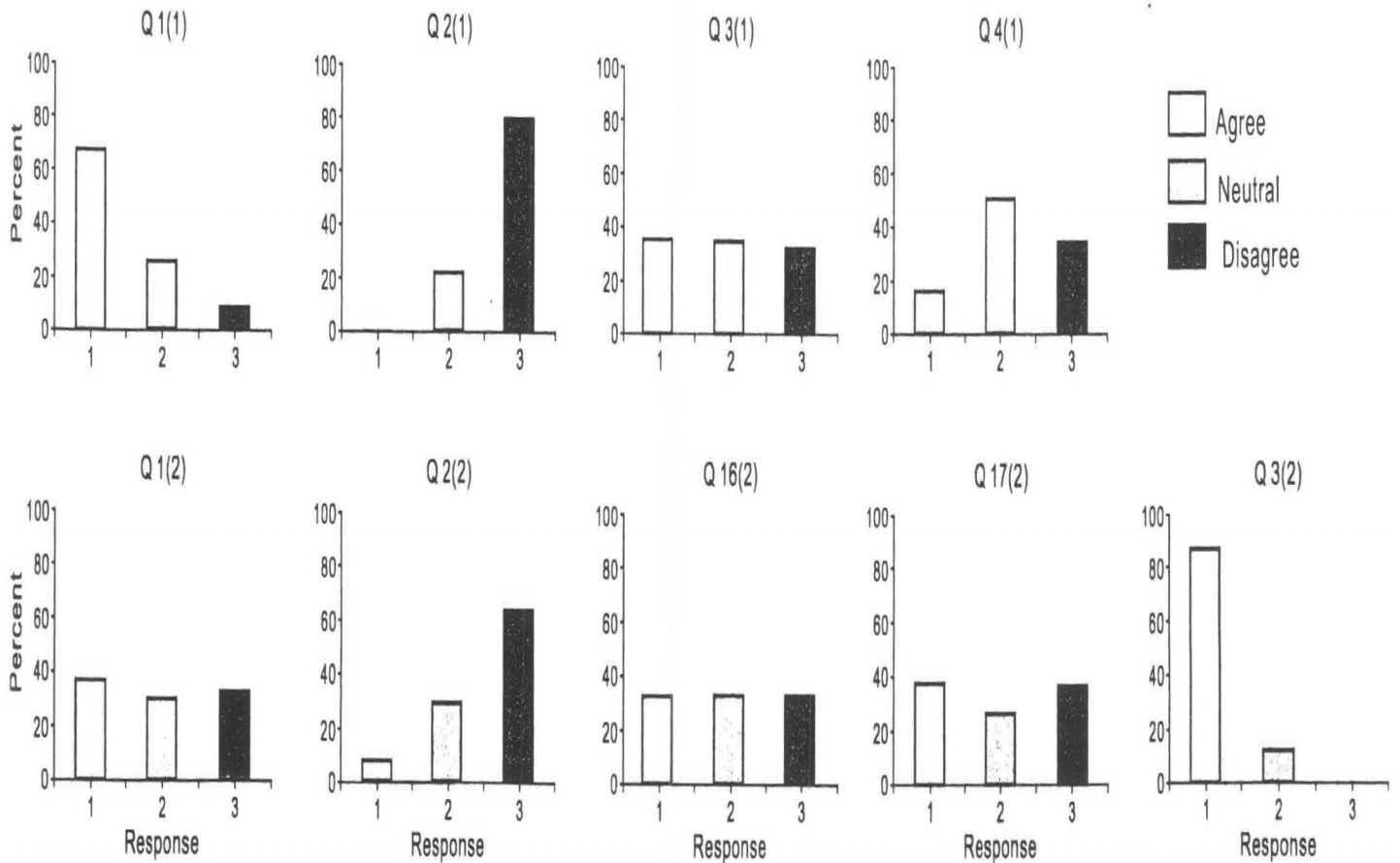
Q 1(1) and Q 1(2) : I expected the kind of questions asked in the test
Q 2(1) and Q 2(2) : The questions were too difficult for a first year course
Q 3(1) and Q 16(2) : I feel we should do more marking ourselves
Q 4(1) and Q 17(2) : If we do more marking, the marks should count

Figure 5.12: Evaluation responses relating to student learning (brackets indicate iteration)
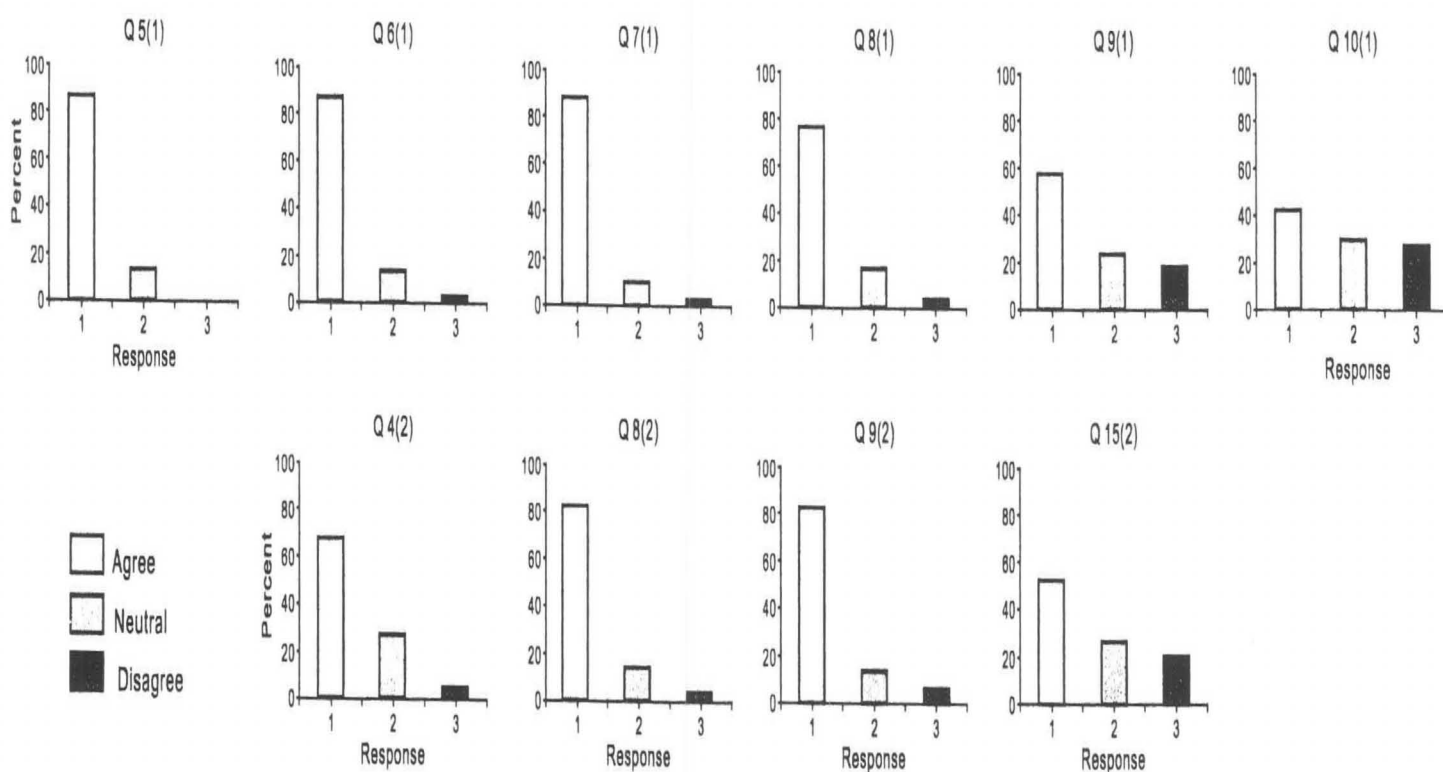
Q 5(1)   : The model answer helped me mark the short question
Q 6(1) and Q 4(2): The model answer helped me mark the essay question
Q 7(1) and Q 8(2): I learned some subject content by marking my own work
Q 8(1) and Q 9(2): Having done this exercise, I will learn differently for my next test
Q 10(1)   : I could write my own criteria and model answer for a set of test questions

Figure 5.13 : Evaluation responses relating to student learning (second iteration only)
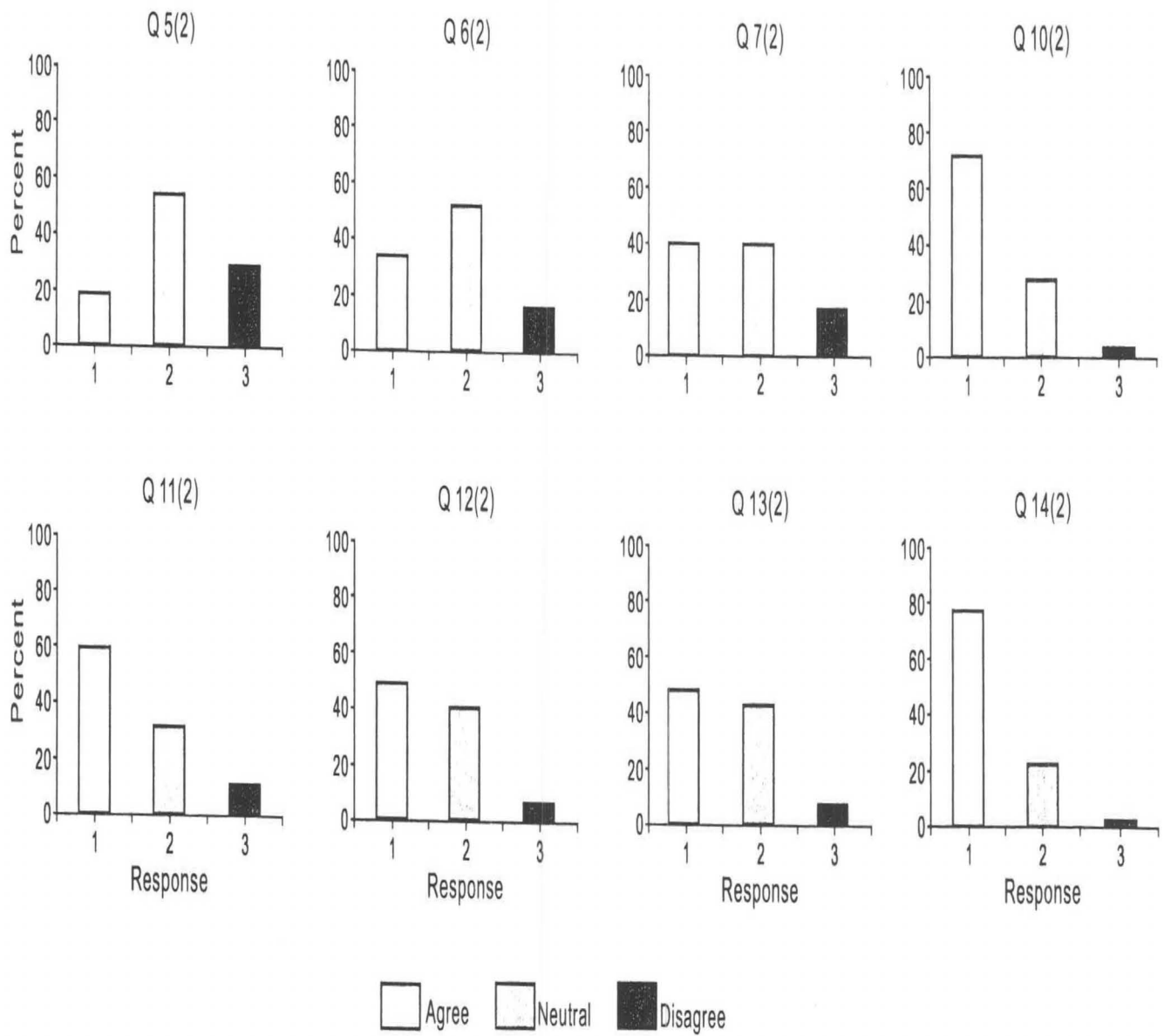
Q 5(2) : I found the self-assessment exercise easy

Q 6(2) : I found the self-assessment exercise enjoyable

Q 7(2) : I found the self-assessment exercise time-consuming

Q 10(2) : I will write in a more structured way in the future

Q 11(2) : I feel more confident about writing essays

Q 12(2) : I feel more confident about working independently in general

Q 13(2) : I feel more motivated about my work

Q 14(2) : I will be more critical in my learning

The vast majority of students felt that the questions were at a fair level (Q2(1), Q2(2), Figure 5.11). There was less agreement around the issue of whether students felt they should be involved in more marking exercises with almost equal numbers of students being positive, neutral and negative (Q3(1), Q16(2), Figure 5.11). Interestingly, in the first iteration when the students marks did not count towards accreditation, the students expressed a neutral to negative response to the question of grades counting (Q4(1), Figure5.11). However, in the second iteration when the self-assessment grade counted for 10% of the final grade, there was a more positive response (Q17(2), Figure 5.11).

The majority of students felt the model answers helped them mark the questions (Q5(1), Q6(1), Q4(2), Figure 5.12). Most students also felt they learned about subject content (Q7(1), Q8(2), Figure 5.12), essay writing (Q8(1), 9(2), Figure 5.12) and formulating criteria (Q10(1), Figure 5.12) by doing the self-assessment exercise. The majority also felt they would learn differently next time (Q9(1), Q15(2), Figure 5.12). There thus appears to be a shift in consciousness and awareness of learning.

Students felt the self-assessment exercise was time-consuming (Q7(2), Figure 5.13), somewhat enjoyable (Q 6(2)), but not terribly easy (Q5(2)). The majority also felt they would write in a more structured way in the future (Q10(2), Figure 5.13), be more confident in their essay writing (Q11(2)) and more critical in their learning (Q14(2)). Students were only slightly less sure about whether they would be more confident about working independently in general (Q12(2), Figure 5.13) or being more motivated about their own work (Q13(2).

In the second iteration students were asked what they liked *best* about the self-assessment process. This revealed a mixed response, but many students commented in some way about the value of learning from their mistakes or from the process in general (Appendix 9). Other issues raised were related to the improvement of essay writing skills, recognition of the difficulty of the process of assessment, the value of using criteria and learning to be more critical.

In response to the question on what they like *least* about the process, the majority of responses were related to the dislike of, or difficulty in, being critical of one's own work (Appendix 10). The actual allocation of marks was also problematic for a number of students, as was the time and effort involved and the issue of bias related to marking one's own work.

In the second iteration students were also asked to comment specifically on the criteria that were problematic. Interestingly, whereas a total of 26 students mentioned criteria related directly to

content, only 20 students mentioned criteria related directly to style, layout and presentation (Table 5.1). The most problematic criterion was that of "Is **relevant** information presented?". In the feedback students gave themselves or their peers, this criterion was particularly poorly handled. (Box 5.1, Student 1). Other difficult criteria that students identified, also relating to content, were "Is there good coverage of the topic?" and "Has material been included that is not directly related to the topic?" (Table 5.1). The former was also repeatedly marked poorly in the feedback (see Box 5.1, student 3). The criteria relating to style and presentation that students identified as presenting most problems were "Are ideas in each paragraph in a logical order?" and "Does each paragraph have a single main idea?" (Table 5.1). Again, this poor understanding was matched in the marking exercise (see Box 5.1, student 4).

Table 5.1: Criteria specifically mentioned by students as problematic in the second evaluation.

	Criteria	Number times criteria were specifically mentioned
Style, layout, presenta tion	**Criteria–style, layout, presentation**	7
	Introductory (first) paragraph • Does it introduce the topic? • Is it clear from the introduction what the essay is about?	1
	Concluding (last) paragraph • Does it summarise and follow from the main argument in the essay? • Are there any new ideas (there should not be)?	1 1
	Body of the essay • Are sentences clearly and logically written? • Does each paragraph have a single main idea? • Are paragraphs in a logical order? • Are ideas in each paragraph in a logical order? • Are diagrams used ? Are they helpful? Are they referred to in the text (they should be)?	 4 1 5
Content	**Criteria – content related** • Does the essay answer the question? • Is **relevant** information presented? • Is there good coverage of the topic? • Has material been included that is not directly related to the topic (it should not be)? • Are examples used? Are they relevant?	6 1 12 4 3

Box 5.1: Comparison of student comments and lecturer comments made in the self-assessment process. The criteria and general student information are presented in normal font, *student comments in italics* and lecturer comments underlined.

Student 1

Is relevant information presented?

Almost all of the relevant information was presented but my essay lacked diagrams and examples that play a role in understanding the essay. There was no irrelevant information presented. (awarded 12/15 for content)

Do not agree. You gave a **description** of biomes. You did not relate **distribution** of **climate** to distribution of **biomes**. You therefore did not answer the question and left out important information and included irrelevant information. (awarded 4/15 for content)

Student 2:

Is relevant information presented?

No reference to temperature and rainfall and how they tie in with the biome and its situation on earth. Names of various other biomes were left out eg shrublands and grasslands. No description of what a biome is – this would help me put my ideas forward. (awarded 8/15 for content)

Agreed (awarded 9/15 for content)

Student 3 (Male, English-speaking)

Does the essay answer the question? *Follows plan*
Is relevant information presented? *Yes*
Is there good coverage of the topic? *Yes*
Has material been included that is not directly related to the topic (it should not be)? *Yes*
Have examples been used? Are they relevant? *Good use of Oklahoma and NW Europe; could have been more later on (awarded 21/25).*

Oklahoma example took up half the essay and was not really relevant to topic. You did not address the issue of why farmers do not conserve soil – which is really the nub of the essay (awarded 10/25)

Student 4 (Female, English speaking)

Does each paragraph have a single main idea? *Yes. It has a heading and explains further about what the heading is about.* Agreed

Are paragraphs in a logic order? *Yes. There is a distinction between positive and negative impacts of erosion and the importance of soil conservation.* I found there was no link between paragraphs and as a result they were very jumbled in order. Made for difficult reading.

Student awarded 11/15 for this section, lecturer awarded 6/15.

The completely open-ended question revealed the enthusiasm of many students for the process, with the majority of comments being positive in both iterations (Table 5.2; Appendix 11 and 12). Many issues raised by the students have been mentioned in the preceding few paragraphs, but a number of new ones emerged in this component of the evaluation. In the positive comments these related to (the brackets indicate first (1) or second (2) iteration, Appendix 11 and 12 respectively):

- the realisation of the importance of essay planning (comment 6(2)),
- the importance of specific criteria (comments 1(1), 5(1), 9(1), 27(1)),
- the importance of structure in an essay (comments 6(1), 13(1), 18(1), 4(2)),
- the use of diagrams and examples (comment 28(1)),
- the value of reflection (comments 2(1)),
- self-assessment being a good form of revision (comment 4(1)),
- appreciation of what is expected (comments 20(1), 26(1), 3(2), 4(2), 8(2), 11(2))
- learning from mistakes (comments 3(1), 14(1), 19(1), 23(1), 24(1), 25(1), 34(1), 8(2)),
- recognising the need to look at different styles of essay (comment 18(2))
- the need for practical skills such those gained as in self-assessment (comment 30(2)),
- the need to include such exercises in following years (comments 12(2), 13(2)),
- appreciation of the marking process (comments 7(1), 8(1), 18(1), 31(1), 32(1), 4(2), 9(2)).

Table 5.2 Percentage of students posting positive, neutral (or having both positive and negative points) and negative responses in the two iterations

	Percentage responses in first iteration (n=55)	Percentage responses in second iteration (n=32)
Positive	64	47
Neutral	15	13
Negative	21	41

Amongst the negative issues raised in the open-ended question students felt:

- the process of self-assessment and being self-critical was difficult (comments 45(1), 47(1), 50(1), 55(1), 20(2), 22(2), 25(2), 28(2)),
- that test questions were not expressed clearly (comments 46 (1), 21(2), 26(2)),
- that time during the test was tight (comments 48(1), 49(1), 24(2), 27(2), 32(2))

- disappointed and frustrated by constantly getting low marks (comments 31(2), 32(2)),
- the need for lined paper (comments 54(1), 23(2)),
- marks for self-assessment should not count (comments 51(1), 30(2)),
- that they had not learned from the process (comment 44(1),
- that they disliked the process (comment 51(1)).

Information on gender and language group was requested in the second iteration evaluation. This was not particularly revealing except that a fairly large proportion (50%) of the English-second-language (ESL) females posted negative open-ended comments (Table 5.3). It should be noted that, as a group, they represent the lower achievers in the class with a mean test mark of 42% (Table 5.3). The levels of frustration for some of these students came through in the actual comments themselves (comments 22(2), 31(2)).

Table 5.3 Breakdown of open-ended comments on the self-assessment process according to gender and language group (second iteration). Also included are mean test marks for each of the groups.

	Percentage			
Comment	Female, English (n=37*)	Male, English (n=31)	Female, ESL (n=14)	Male, ESL (n=7)
Positive	16	16	21	14
Negative	3	16	50	0
Mean test mark	55	62	42	56

* number that completed evaluations

5.6 Interviews

The interviews were used both as a teaching opportunity as well as one in which student perceptions on the self-assessment process were recorded. With respect to the latter, a number of important issues emerged that had not been raised before. Firstly, students mentioned that the most valuable part of the exercise in terms of learning what was required of them was *from the comments written by the lecturer on their self-assessment process*. Many had felt unsure of their own self-assessment, despite the criteria sheet and model answer. However, individual and specific comments from the lecturer had clarified many aspects for them. The lecturer's perception was that the interview itself was an important component of this learning process.

Secondly, it appears that the confusion of the criteria relating to 'relevance' may have deep-seated roots. In the school system students could respond in a very general way to a very specific question, and still achieve high marks. They therefore never had to judge the relevance of the information they were presenting, and instead 'threw' whatever they knew that was even distantly related to the topic and they managed to score well. The answers expected in this study, and in all Geography assignments, were fairly specific and needed to relate *directly* to the topic. This presented problems for many students. This 'shotgun' approach to answering questions is discussed more fully in the following chapter.

Thirdly, the *type* of essay that was required in the second iteration presented problems for a number of students. They were required to write a speech for farmers, as an environmentally aware politician, with regard to soil erosion (Appendix 4). Many students interpreted this as a topic which did not require much depth nor much in the way of factual content. Unfortunately, the lecturer had interpreted this in a different light and expected a fair amount of factual detail as well as a well structured and ordered essay.

5.7 Overall picture

Much has been revealed in the above detailed analysis of the self-assessment process. In order to make it easier for the reader, a summary of the *general trends* are outlined below.

- Students showed increased insight into the process of self-assessment with practice.
- Good students tended to under-estimate, poor students over-estimate grades.
- Students were critical when marking an anonymous peer.
- Students tended to be less critical when marking themselves.
- Students battled with understanding/implementing certain criteria.
- Students found it hard to separate out content from structure and style in an essay.
- Students generally saw credit and value in the process of self-assessment.
- Students were generally positive about the process of self-assessment.
- Students were reluctant to engage in the process of self-assessment on a more regular basis
- Students felt the feedback comments on the self-assessment were the most valuable learning exercise.

6   DISCUSSION

6.1   Key question 1: Did involvement in peer and self-assessment assist in moderating student expectations of grades?

Although students may ultimately be expected to pursue self-directed study based on self-generated criteria, initially they need to be *able to recognise* their competence in relation to externally derived standards (Fazey, 1999). It was stated earlier that the perception of the lecturer was that there was *poor recognition* of competence and that student expectations of grade were usually higher than the achieved grade, a suggestion also made by Peckham & Sutherland (2000). This study has revealed that this is not necessarily the case. The first group of students showed a tendency to over-estimate and the second group to under-estimate the grade they would receive, both before and after the test.

Interestingly the pre-test estimates were most inaccurate, these improved slightly post-test, and the actual grade they awarded in the self-assessment was even better. Although the estimates (pre- and post-test) and self-assessment grades are not directly comparable because they were each obtained under a different set of conditions, the increase in correlation values, as well as a shift from the correlation being not significant to significant, indicate a better awareness and recognition of their own worth in the test. The qualitative comments of students support this notion with students indicating their increased insight into the process of assessment, with a number commenting on a better understanding of the (often) poor grades they receive. This was achieved in a remarkably short period of time.

It appears therefore that the process of self-assessment has in fact played some role in moderating student expectations of grades. A similar trend was reported in Peckham & Sutherland (2000), although their final correlation between student and lecturer grade was far superior (R values > 0.9). This may be due to the fact that their study was conducted in a first year chemistry class in which essay writing is far more structured compared to that of a discourse subject such as geography. Correlations in similar studies can be extremely variable and factors such as age, experience in the assessment process, type of assessment, level of learning, and criteria breakdown can all be confounding factors (see Falkichov, 1986). This highlights the fact that such findings are very context-specific and it is difficult to draw generalised conclusions from them.

6.2 Key question 2: How, and in what way, did student assessment grades compare with those of the lecturer?

6.2.1 Relationship between self-assessment grades and lecturer grades

The relationship between student allocated grades and those awarded by the lecturer, despite being statistically significant, was rather weak. However, this does not necessarily reflect students' inability to self-assess but perhaps rather their inability to award grades. Boud (1989) mentions that such mis-matches of grades may be due to student inexperience in awarding grades. Comments by students in this study support this notion: '*I don't like marking because it is hard to know exactly what mark a person deserves*'. Furthermore, mis-match can also be a function of the difficulty students have in being objective about their own work (Woods *et al.*, 1988; Boud, 1989). Again this contention is supported in this study: '*With marking your own test, one is sometimes unable to see when they are wrong*' and '*It is hard to comment or give suggestions about your own writing*'.

Recognition of these problems of inexperience and lack of objectivity probably contribute to the resistance of students to the process of awarding grades. This reluctance was further reflected in the neutral to negative response (closed question) of students in the first iteration about grades counting for accreditation. However, since it is recognised that use of student-derived marks for accreditation can encourage better student involvement in the process (Boud, 1989), the marks students awarded were worth 10% of the final mark in the second iteration. Interestingly, in this case, students showed less resistance towards grades counting towards accreditation. It is not clear why this should be so, but may perhaps be due to the fact they were far more familiar with the concept of grading according to criteria due to increased exposure during tutorials. It is felt however, that with more practice they could well become even more confident at grade allocation.

The inclusion of student-derived marks counting for accreditation may well have created a different dynamic in the assessment process: over-estimation of grades was far greater than in the first iteration. Although not specifically raised in the evaluation, students did mention in the interviews that they were conscious of the grades counting and as a consequence preferred to err on the side of leniency.

The component in which the *lecturer* provided a grade for student self-assessment was incorporated into this study for two reasons. Firstly, it was in recognition that there is often a general lack of credibility of student-awarded grades (Boud, 1989). It was felt the lecturer grade of student self-assessment would be a better reflection of their assessment abilities and it had the added advantage

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in the second iteration of serving to counter the inflated student grades. Secondly, some studies have shown that *feedback* is one of the most important learning components of the assessment procedure (Gibbs, 1999; Loacker & Jensen, 1988). However, this is usually in the form of *test* feedback. Since self-review and assessment was being engendered in this study, it was felt it would be constructive to provide feedback on the test *as well as* the self-assessment. It is revealing, although somewhat expected and in line with other studies (see Boud, 1989), that those students that did poorly in the test were the least able to be critical of their own work. An anecdotal example of this is in Box 5.1 (p51) where the comments of a weaker student (student 1) and a stronger one (student 2) are provided. It is also interesting to note that a number of the students interviewed at a later stage indicated they felt the feedback received from the lecturer for their own assessment was the most valuable part of the whole exercise in terms of their own learning. Therefore, despite the additional work entailed, it is felt that this component of the process should be maintained and perhaps even introduced into other academic development situations.

6.2.2 Extent of student over- and under-grading compared with lecturer

Peer assessment

In contrast to findings in similar peer assessment studies (see Falkichov, 1995), students in this study were generally strict when marking an essay written by a peer. This may be due to the fact that, in most studies, the peer is usually a friend or acquaintance. In this study, the 'peer' was an anonymous student from the previous year. It is likely students felt no obligation towards this 'peer' and did not feel embarrassed judging them.

The peer essay was written by a second language student. The lecturer had awarded poor grades in the style component of the essay (introduction, conclusion, writing style), but awarded reasonable marks for content. In the first iteration the students showed a similar trend to the lecturer in marking with respect to writing style but were much harsher with respect to content. This may due to a number of factors.

Firstly, an examination of the feedback comments of the students revealed that students did not discriminate well between style and content. Since the essay was written in a poor style, the students could easily criticise the *style* based on criteria such as logical flow and a single idea per paragraph, but it was difficult for them to recognise whether the *content* was correct based on the criterion related to relevance of information. As a result the peer received low marks for content from the students despite having presented most of the relevant information, albeit in a rather

jumbled fashion. The separation out of content and writing style in this context must be a fairly high level skill requiring a very clear understanding of the distinction between the two. A similar trend is noted in a study by Falkichov (1986) in which the criteria (a) relevance and (b) answering the question present the most difficulty to students. Interestingly the criterion 'Is relevant information presented?' was identified by students in the evaluation in this study as being the most difficult. This obviously needs intervention in future teaching interactions.

Secondly, the 'style' category was broken down into smaller components with a number of specific criteria to examine in each category. It is well recognised that a breakdown into individual criteria is an important component for directing student learning (Loacker & Jensen, 1988). The high level of detail in the 'style' component of this study probably afforded more guidance to the students than did the more general content category. Thirdly, the emphasis in the whole study (including tutorials) was on writing style, perhaps at the expense of content. It is possible students perceived that style was the most important part of essay writing and put less effort into content marking. To try and counter this equal emphasis was given to both style *and* content during teaching interactions in the tutorials in the second iteration. This may have contributed to students coping better when marking peer content in the second iteration.

Self-assessment

The same trends observed in marking of the peer essay (better for style – first iteration; better for content – second iteration) were evident in the marking of their own essays. There was a general trend, however, also evident in the marking of the paragraph, of over-estimation of content for *all* students. Comments made by students in the informal interviews may shed light on this phenomenon. A number of students indicated a perception that if they provided sufficient facts, even if only remotely connected to the topic, they would be awarded marks for content. This 'shotgun' approach to answering questions seems to have been successful at a school level and a number of them expressed surprise (and dismay) that this was not what was expected at a tertiary level. This perception of the effectiveness of the 'shotgun' approach is well illustrated in the written feedback of a particular student in the self-assessment. In response to the question as to whether there was 'material included that was not related to the topic?', the student stated '*The idea of the effect of ocean currents was discussed which may not have been relevant but the idea was clearly explained*" (author's underlining). The student awarded a far higher mark than did the lecturer.

The issue of general over-estimation of marks in the second iteration is worthy of further comment. It has already been stated that students may have inflated marks somewhat due to the fact that grades counted towards accreditation. A further contributing factor may be the actual phrasing of the test question itself. By asking the students to write a *speech* they assumed a more emotive and less factual essay was required. As a consequence, the lecturer marked more strictly than the students. Interestingly, despite an extensive body of literature on the dynamics of the process of peer and self-assessment, no reference was found relating the influence the *actual assessment procedure* (in this case the test) has on the entire process. It is likely that many issues (such as type of question, physical setting of the assessment, level of students *etc)* must play a role and should be taken into consideration. In fact, this was a concluding criticism in the extensive review article on peer and self-assessment by Dochy *et al.* (1999).

Some self-assessment studies have achieved reasonable reliability (within 10% of tutor grades - Falchikov, 1986; Stefani, 1998; Orsmond *et al.*, 1996), which was not the case in the present study. The above comparison of student- and lecturer-derived grades in fact revealed fairly inaccurate as well as conflicting results – rather like Schön's (1983) 'swampy lowlands'. Perhaps it should be recognised that *many* different factors will influence the grades students award, despite the fact that, in this case, they were rewarded for high integrity marking. In this study the groups were large and extremely heterogeneous in terms of gender, race, educational background and current educational goals, and as a result student grades are perhaps *unlikely,* particularly at a first year level, to match those of the lecturer. If the main purpose of the exercise is not for summative accreditation but for formative student learning, as was the case in this study, the quantitative *extent* of over- or under-estimation is less important than the actual learning that is taking place. As Orsmond *et al.* (2000) point out, the success of assessment practices should not be judged on the agreement between student and lecturer grades, but on how the student develops through the process.

6.3 Key question 3: Did a breakdown of criteria assist in the peer and self-assessment process?

Orsmond *et al.* (2000, 1997, 1996), in a series of studies examining the use of marking criteria, highlighted the importance of providing marking criteria to assist in the assessment process. They also indicated, as did Stefani (1998), that students often have a different understanding of individual criteria compared to that of the lecturer or tutor. The quantitative evidence in this study supports this contention – particularly with regard to students not always being able to discriminate between issues of writing style (logical flow, single ideas per paragraph) and content (relevance of information presented, irrelevant information). However, in the qualitative evaluation in this study

many students commented on recognising the value of criteria in assisting the process of peer and self-assessment. Furthermore a number of criteria which students found difficult were identified. These need to be addressed in future teaching interactions.

Apart from the learning aspect for students, a further positive aspect of using criteria is it becomes possible to analyse aspects of the marking process in more detail. Had students been asked to assess in a more general way in this study, little insight would have been gained in terms of student understanding, and identification of problem areas would not have been possible to the same extent.

6.4   Key question 4: Did involvement in peer and self-assessment affect motivation, attitudes and approach to learning?

The evaluation in this study revealed that the overwhelming majority of students perceived the exercise in peer and self-assessment, despite it being not that easy, moderately enjoyable and fairly time consuming, as being extremely valuable in the learning process. In particular students indicated a perceived increase in motivation, confidence and critical ability. Nonetheless, and similar to findings in other studies (see Boud 1989), there seemed to be a reluctance by some to be involved in such exercises in the future. This may be due to the fact that self-assessment is such an unfamiliar concept to them (only one student mentioned that they had ever been involved in self-assessment) and is so different from most of their other learning interactions. This gives rise to anxiety and resistance to the process (Woods *et al.* 1988), and it is likely therefore that students in this study are simply exhibiting classic inertia to change. To overcome this inertia it is suggested students need to become more familiar with, and participate in, self-assessment exercises on a far more regular basis, albeit perhaps in a less structured and formal way than has been practised in this study.

6.5 Conceptual framework of student involvement in the assessment process

Prior to this study it was recognised there were inherent problems with the *traditional* forms of assessment in the first year geography modules. *Educational* forms of assessment were therefore incorporated into the Environmental Geography 1 module in an effort to improve student learning. It was felt that by participating in peer and self-review exercises, students' self-reflective skills could be developed. In this way students would become more self-reliant with respect to their own academic development (Falchikov, 1995; Boud & Fachikov, 1989) and equip them to become life-long learners (Dochy *et al*, 1999). It was hoped these interactions would fall within the realm of what Rowntree (1987) describes as 'preparation for life'.

The idea that traditional and educational forms of assessment in fact represent two extremes of a single continuum has been conceptualised in Figure 6.1 below, where extent of lecturer and student involvement are the main considerations. The left of the continuum represents traditional assessment where the lecturer has full control of the process and learners are dependent upon the lecturer to determine their progress. Student involvement is nil. This would probably be a fair representation of first year Geography modules prior to this study. Moving towards the right, lecturer involvement decreases and student involvement increases until, at the extreme right of the continuum learners are completely independent of authority in terms of their own assessment. Although this latter position on the continuum may not represent a real situation, particularly in current University settings, it is an end point *towards* which we should perhaps be moving. Ultimately students, once they leave the formal learning environment, will need to have the confidence and ability to be independent, self-reflective individuals.

Figure 6.1 Conceptual framework for extent of involvement of lecturers and students in the assessment process
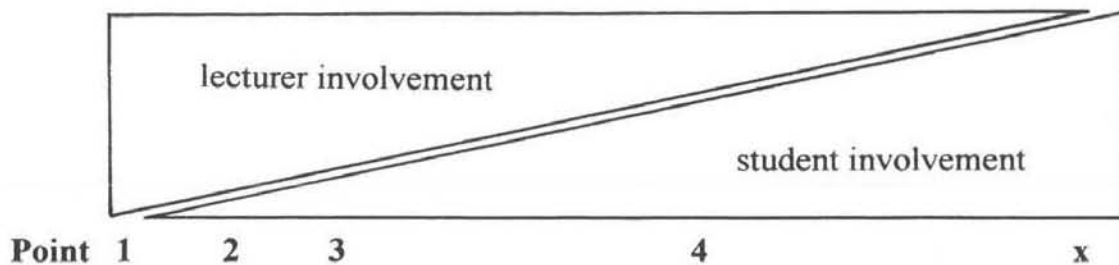
	Point 1 (traditional assessment)	Point 2 (first iteration)	Point 3 (second iteration)	Point 4	Point x (educational assessment)
Authority and power	lecturer	lecturer	lecturer	lecturer and student	student
Nature of assessment	formal	formal	formal	less formal	informal
Type of assessment	lecturer marking	peer and self-assessment	peer and self-assessment	collaborative assessment	independent assessment
Learning and assessment	separate	some integration	some integration	further integration	complete integration
Extent student involvement	none	some	some	increasing	complete
Recognition of student involvement	none	some	more	increasing	complete
Criteria	imposed by lecturer	imposed by lecturer	imposed by lecturer	negotiated	student derived
Student awareness of criteria	none	some	some	increasing	complete

It may be useful to try and locate this study within the conceptual framework. Point 1 on the continuum (Figure 6.1) represents the situation in Level 1 Geography modules in general, and Environmental Geography 1 in particular, prior to this study. Assessment was usually formal, the lecturer had full authority and power over the assessment process, and students were not involved. The first iteration of this study can be viewed as a first step along the continuum towards the right (point 2). This represented a shift towards some student involvement, with some recognition of their efforts, and a better awareness of the process by being informed about marking criteria. The assessment procedure was still formal and the lecturer still had authority over the process. The second iteration, where student participation contributed towards final accreditation, shifted the assessment procedure further to the right along the continuum (point 3).

Approaches that can be incorporated into the assessment process to promote a further shift towards the right are many and varied. With regard the Environmental Geography 1 module, increased collaboration – for example through the negotiation of marking criteria as well as smaller and more varied exercises of peer and self-assessment could be included at many more teaching interactions (lectures, tutorials *and* practicals). Other means of improving self-reflective skills would be to include more collaborative approaches to peer and self-assessment, or include procedures such as learning portfolios, reflective journals, group work, learning logs *etc*. However, it is recognised that intervention in a single module will not be truly effective in terms of improving student learning with respect to independence and reflexivity, unless it is reinforced in other modules throughout their curriculum.

It has been mentioned earlier that Boud (1995) recognises that self-assessment can either take the form of a formal task, or it may in fact be an informal, on-going process in which students constantly engage. The resistance and difficulty students experienced with the formal self-assessment process in this study indicate they are still far removed from being self-reflective, independent learners. It is suggested that perhaps the approach taken in this study (ie. still assessing within the formal structures with which the students are familiar), is a *necessary* step in the process towards self-determination. This is supported by the contention of Stefani (1998) and Boud (1990) that students need guidance in the early stages of the self-assessment process.

Another issue requiring consideration is not only that of the *extent* of involvement of lecturers and students, but the *power relations* that exist between the two parties. It is argued by Reynolds & Trehan (2000: p271) that 'If self-awareness, consciousness-raising or reflexivity are introduced into the assessment process without power, authority and judgement-making being examined or

changed, students have even less control than in more traditional methods'. They suggest that the issue of power and authority needs to be a central focus of analysis in the context of critical pedagogy, and that in practice the role and intentions of the lecturer and student needs to be clarified. This issue of power and authority gives rise to complex social processes (Reynolds & Trehan, 2000) and could form the focus of interactions and research in the Geography modules in the future.

6.6   Critique of my role in the action research approach

This study, with two iterations of essentially the same type of teaching interaction provided what seemed a perfect framework for an action research approach. It was assumed that after planning, acting and observing in the first iteration, critical reflection would lead to measurable improvements in the second iteration. This was not necessarily the case. This has highlighted for me two separate issues. Firstly, the response of individuals to the process is very context specific, and as a result, extremely variable. This is supported by the work of Stefani (1998). Secondly, perhaps I did not engage sufficiently critically on the process in order to make the necessary changes. For example, after the first iteration it was recognised that students were reluctant to grade themselves, but for the *sake of comparison* in the second iteration this component was maintained. In terms of good teaching, this should have instead been omitted or included in a less threatening way such as Likert Scale grading.

From my own point of view the interactions with the two groups were very different. I actively lectured in the first iteration and set my own test questions. The group was smaller and as a consequence I knew the students a lot better and felt I had developed a rapport with them. Due to unforeseen circumstances I was unable to lecture in the second iteration and, although I was still involved in academic development in the course, felt I did not have the same rapport with the second group. This was compounded by a particularly disruptive group of male students who created an awkward atmosphere in many of the teaching interactions. Again this has highlighted for me a very important issue: the dynamic of the teaching situation can have a profound influence on the process, and results need to be interpreted in this light. With this is mind, it can be said that it is perhaps not all that fruitful to *compare* data from the two iterations, but instead concentrate on the process and the influence of the process on student learning, as suggested by Orsmond *et al.* (2000).

6.7 Concluding comments

As a result of this study the skills component in the tutorials in Environmental Geography 1, particularly with respect to that of essay writing, has been vastly improved. Even without the peer and self-assessment exercise, this improvement in itself should serve to assist students considerably in their studies.

Nonetheless, a large part of the success of this study is that students felt they had a beneficial experience in peer and self-assessment. They appear to have acquired an awareness of the value of criteria in assessment and can apply them to some degree in their own context. The component of the study in which they received feedback from the lecturer on the self-assessment appears fairly innovative and was considered by the students as extremely valuable in the learning process.

It is recognised that various aspects of the study could be improved upon. Stefani (1998) indicated that diversity in social, cultural and political backgrounds can lead to many different interpretations of criteria. In this regard, this study highlighted the large gap between lecturer expectations in a written answer and what the students felt was acceptable. In particular, students had problems with being able to discriminate and internalise certain criteria such as relevance of information and in general resorted to what has been termed the 'shotgun' approach when providing answers. Further studies are needed to address this issue of student understanding and internalisation of criteria, particularly in the South African context.

In terms of increasing the learning value for students it would probably be more constructive to initially incorporate many small (for example 10 minutes at the end of a particular exercise) peer and self-review exercises in the tutorials and practicals, in which students give feedback but not necessarily grades. In these early stages, as Stefani (1998) and Falkichov (1995) indicate, feedback from the lecturer or tutor is essential. Students would gradually increase in independence in this regard and, with familiarity, the more formal process of peer and self-assessment as described in this study could be implemented. Furthermore, the process of awarding grades is obviously intimidating for many students. Either this can be eliminated from the process altogether, if the purpose of peer and self-review is formative. Alternatively a more qualitative approach could be used.

Despite the above comments, it must be emphasised that the real value of the study has been to open up dialogue with students with respect to our teaching and their learning. By participating in the peer and self-review process they have become more aware of the 'hidden' aspects of the

curriculum and as a result should be more critical of their own work and be able to work in a more self-reflective and independent way in the future. In other words it should help to encourage a deeper approach to learning. Furthermore, tutors expressed enthusiasm for the exercises and felt both they and the students had benefited from participating in the process. In addition, the two other staff members involved in the Environmental Geography 1 course have commented on the high standard of style and content in written answers in the final exam compared with previous years. Although there is no concrete evidence to support this, it is likely this study has contributed in no small way to this improvement.

Finally, my own understanding of the dynamics of the process of student learning has changed considerably and I have in fact been a co-learner in the process. Hopefully this will, in some small way, contribute to better teaching and learning interactions in the future.

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APPENDIX 1

Test, criteria sheet and model answer (first iteration)

SCHOOL OF LIFE AND ENVIRONMENTAL SCIENCES

ENVIRONMENTAL GEOGRAPHY 1 - TEST 1, SEPTEMBER 2000

STUDENT NUMBER: ....

Please answer the question below before reading the rest of the test.

Based on the quality and quantity of time you have spent learning for this test, what mark do you think you deserve for the test? ....(%)

Diagrams may be used to assist you in answering any of the questions. You must answer two questions: one from section A (page 1) and the one from section B (page 2). Please write in pen.

SECTION A (10 MARKS)

Answer ONE of the following questions:

EITHER
1. Discuss the concept of consumption overpopulation.

OR

2. Discuss the role fire plays in the biomes of southern Africa.

3. Briefly describe the **relationship** between the distribution of the world's climate and the biomes that occur in the tropics and subtropics (i.e between 30° north and 30° south of the equator). Focus particularly on temperature and rainfall as determinants (causes) of biome distribution.

Please answer the question below once you have completed the test.

What mark do you now <u>think</u> you will get for the test? ....(%)

PRACTICAL 4 - EXERCISE 2: TEST MARKING (OWN TEST)

Please return this test assessment sheet **with** the test script. You may write feedback comments on the test script as well.

Student number: ....

Comments on questions number one or two.

Criteria	Y/N	Comment/ suggestion (here or on essay)	Mark
Writing style • Were sentences clearly and logically written? • If you gave the answer to a non-environmentalist (eg a business student), would they understand it (they should be able to)?			Out of 2
Content (see model answer) • Was all the relevant information presented? • Was material included that was not directly related to the topic (it should not be)? • Were diagrams used ? Were they helpful? Were they referred to in the text (they should be)? • Were examples used? Were they relevant?			Out of 8

Total mark (out of 10)   ....

Comments on essay question number three.

Criteria	Y/N	Comment/ suggestion (here or on essay)	Mark
Introductory (first) paragraph • Does it introduce the topic? • Is it clear from the introduction what the essay is about?			Out of 3
Concluding (last) paragraph • Was the key idea presented here? • Were there any new ideas (there should not be)?			Out of 2
Essay paragraphs • Does each paragraph have a single main idea? • Are paragraphs/ideas in a logical order? • Were sentences clearly and logically written? • If you gave the essay to a non-environmentalist (eg a business student), would they understand it (they should be able to)?			Out of 10
Content (see model answer) • Was all the relevant information presented? • Was material included that was not directly related to the topic (it should not be)? • Were diagrams used? Were they helpful? Were they referred to in the text (they should be)? • Were examples used? Were they relevant?			Out of 15

TOTAL MARK: (out of 30)   ......

ENVIRONMENTAL GEOGRAPHY 1
TEST 1
MODEL ANSWERS

1. Discuss the concept of consumption overpopulation (10 marks)

Each child that is born needs education, food, water, clothing, eventually a job to survive. Providing all of these usually requires a lot of **natural resources**. Since many of the less developed countries (**LDCs**) **have large numbers** of people, these countries are often blamed for **environmental degradation**. However, the more developed countries (**MDCs**), although they have less people, can cause as much **damage to the environment** as the LDCs because of the **way they use resources**. A single person in the MDCs produces more toxins (**pollution**) and **consumes** more resources (such as food, energy sources, raw materials etc) than many people in the LDCs. **Therefore, less people can have a great impact on the environment due to their consumptive lifestyle**. This is referred to as consumption overpopulation and the effect on the environment can be depicted in the following diagram:
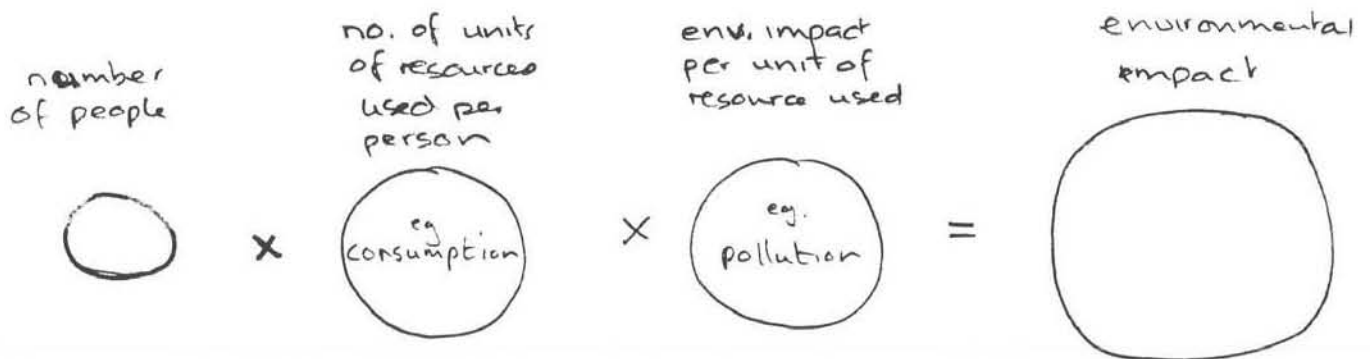
2. Discuss the role fire plays in the biomes of southern Africa

Fire plays an important role in determining the structure and species composition of three of the major biomes in southern Africa. The **grassland** biome occurs in regions which have sufficient moisture (400 – 800mm pa) to support tree and shrub vegetation. However, **trees and shrubs are largely excluded** from the grasslands by fire. **Grass plants** are well **adapted to survive fire** as their growing points (apical buds) are situated below ground or right at the ground surface. When grasses burn in fires the apical bud is not affected, and grasses simply re-grow after a fire. **Trees** and shrubs, however, have their **apical buds above ground**. When a young tree is burned, the apical bud is damaged and the tree dies. Fire also plays a similar role in the **savanna** biome – allowing a high grass cover to be maintained.

The vegetation in the **fynbos** biome is also well adapted to fire. Most of the plants have high **alkaloid** content which burns easily. Many species cannot **germinate** unless the seeds have been burnt in a fire.

Two biomes in southern Africa are not affected by fire. The karoo biome only receives 200-500 mm pa, which means it is unproductive and as a consequence there is not enough biomass for fires to be a feature in this biome. In contrast, the forest biome is too moist (>1000 mm pa) for fires to occur.

3. Briefly describe the <u>relationship</u> between the distribution of the climate and the biomes that occur in the tropics and subtropics (i.e between 30° north and 30° south of the equator). Focus particularly on temperature and rainfall as determinants (causes) of biome distribution.

A **biome** can be described as a **complex of ecosystems which is based on vegetation structure, has a wide geographical extent and its distribution is determined largely by climate**. The two components of climate that play an important role in biome distribution are that of **temperature** and **rainfall**. This essay will examine the distribution of the biomes in the tropics and sub-tropics in relation to both of these factors.

At the **equator** the suns rays strike the earth's surface directly resulting in **warming** of the soil and air in this region. This **warm, moist air rises**, with **precipitation** occurring once the air reaches higher altitudes and has **cooled down** (see Fig. 1). The **climate at the equator is therefore warm and moist** (>2000 mm pa) for most of the year, resulting in the development of **tropical rainforests.**

The air that rose at the equator loses its moisture and **subsides at approximately 30° N and S** (Fig. 1). The climate in these regions is therefore **dry** (usually <250 mm pa), with rainfall occurring in the summer months. It is also relatively **warm**, as the sun's rays are still fairly direct, although night temperatures can be cold. This is the main region of the **deserts** of the world.

Between the equator and 30° N and S, savannas, grasslands and shrublands occur, depending upon local conditions. **Savannas and grasslands** occur in regions that experience **moderate** (400-900 mm pa) **rainfall** that falls in the summer months, and **cool, dry** winters. The **grassland** winters are, however, **colder**, which prevents the growth of trees. **Shrublands** with grass occur in **semi-arid** areas (200-500 mm pa) with seasonal rainfall occurring in the summer months. In regions that experience **cool, wet winters** (450-900 mm pa) and hot dry summers, a **temperate shrubland** biome (chaparral) is common, usually in coastal regions.

This essay has shown that the **amount and distribution of rainfall as well as seasonality of temperatures** determines the **distribution of biomes.** Warm moist areas at the equator support tropical forest, and with decreasing rainfall and temperatures these forests grade into savannas, shrublands, grasslands and finally deserts, which are warm and dry, at 30° north and south

figure Diag. showing distribution of world's major biomes

tundra
grassland/conifer forest
deciduous forest
grassland/savanna/shrubland
desert
(ditto)
tropical rainforest
(ditto)
desert
(ditto)
temperate deciduous forest
grassland
tundra

900
66°N
30°N
equator 0°
30°S
60°S
90°S

78
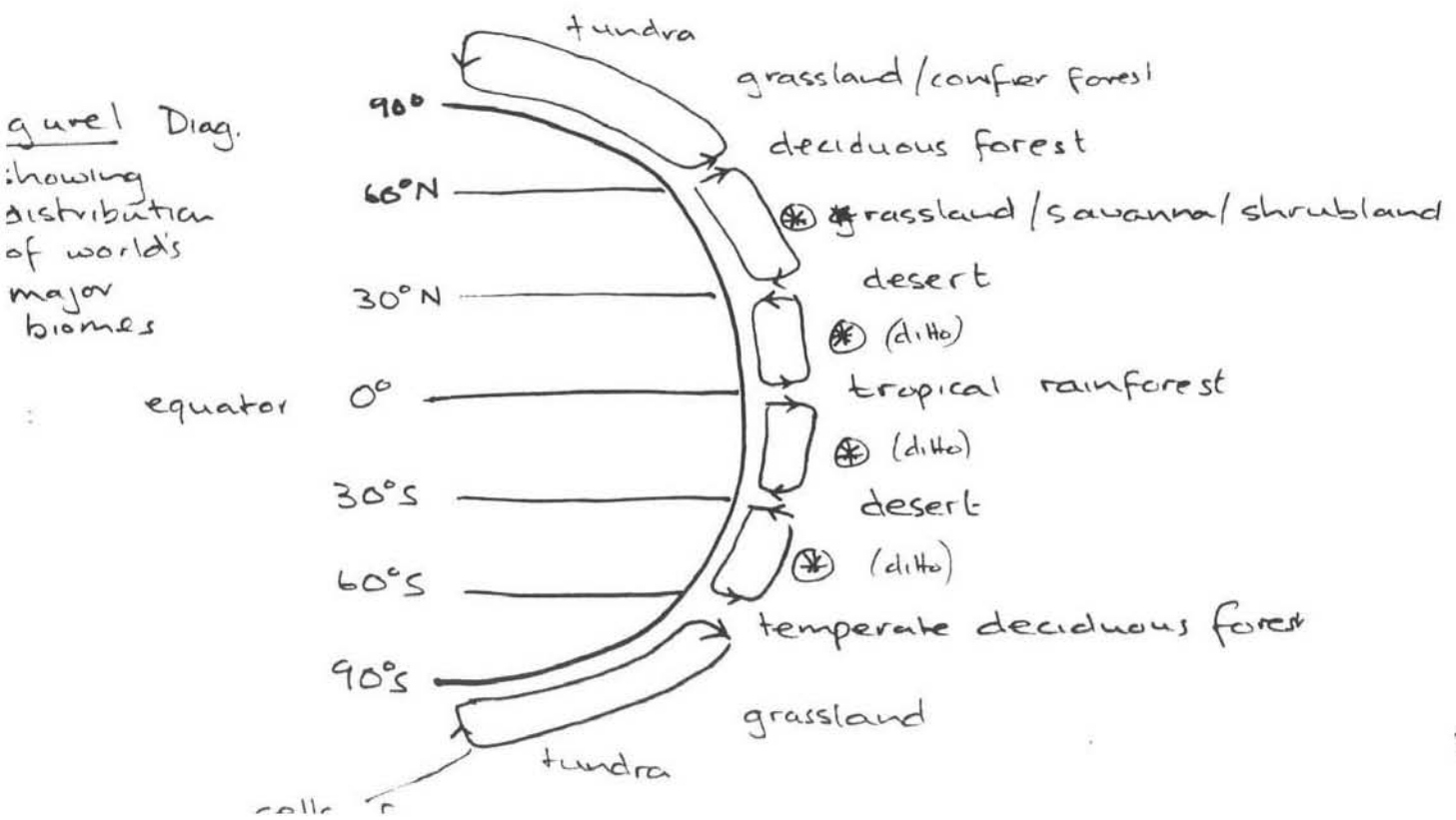
APPENDIX 2

Practical 4: peer essay, criteria sheet and model answer
(both iterations)

PRACTICAL 4
MARKING YOUR OWN TEST

AIM: To use a given set of criteria to mark a test

OBJECTIVES:
By the end of the practical you should be:
- Able to apply certain criteria when marking an essay of a peer and your own essay
- Able to provide a mark/grade based on the application on the criteria
- Aware of pitfalls associated with writing and assessment of essays
- Able to evaluate the worth of the exercise in terms of your own learning
- More confident in your own self-reflective abilities

INTRODUCTION
Whenever you hand in a practical, a tutorial, a test or an assignment, the lecturer (or tutor or demonstrator) comments on the work (hopefully!) and awards a mark. This process of testing your knowledge or skills and commenting and awarding of grades is referred to as **assessment**.

There are three main reasons we do assessment. Firstly, its main function should be that of learning. Provided students get sufficient and pertinent feedback, assessment can form a very valuable learning function for the students within a course. Secondly it is a way of staff and students being able to monitor progress and understanding in a particular subject. Thirdly, it is used to provide marks which indicate whether or not a student has sufficiently 'mastered' the skills and knowledge of the subject (i.e. for accreditation purposes).

Multiple choice questions and short answers are generally easy to mark as there is usually a right or wrong answer based on a certain set of facts. However, marking of other forms of answers, such as essays and assignments, is far more complex as the content forms only a part of the assessment. Recognition of, and awarding grades for, other skills such as being able to write clearly, being able to structure an essay coherently *etc*, become an important part of the assessment.

Traditionally students are not involved in the assessment process. In the practical today you are going to be involved in assessing both the work of a fellow student as well as your own work. Much research in the educational literature, has shown that when students become involved in self-assessment, they tend to:
- Become more responsible for their own learning
- Become more self-reliant with respect to their own academic development
- Become more confident in their ability to perform
- Become more self-reflective
- Improve grades.
Hopefully this is sufficient incentive to become involved in the process!

EXERCISE 1 – PEER MARKING
You have been given a copy of an essay that was written by a student in the 1999 final exam. The title of the essay was:

A model of environmental degradation developed by Ehrlich & Holdren in the 1970's can be summarised as:

Environmental impact = population x affluence x technology

Write a short essay explaining the model.   (50 marks)

Using the *criteria sheet* and *model answer* provided, mark the student (peer) essay. This involves reading the essay through fairly quickly to get a sense of what the student has written. Then go through it more thoroughly and comment, either within the text and/or on the criteria sheet where you think there are problems as well as where you think the essay is good. Complete the criteria sheet, making sure that the marks you award are a reflection of the comments you make. Try to be as detailed as possible during the whole assessment exercise as the comments you make are supposedly intended as feedback for the student from which they can learn and improve their essay writing (in this case, this is what you will get marked on for the practical).

EXERCISE 2 – SELF-ASSESSMENT

Having completed the above exercise, it would be useful for you to discuss the difficulties you had with your demonstrator (perhaps as a group discussion) before moving on to the self-assessment. This tends to be a more difficult exercise as it is hard to be objective about your own writing.

During this exercise you should follow the same process that you did in the peer assessment, but this time you will mark the essay you wrote in the test. Remember to give yourself lots of feedback – as this both serves as a learning experience for you, but you will also be marked on the accuracy and usefulness of the feedback you give yourself.

The mark you will finally receive for the test is as follows:
     80% - actual mark you receive from the lecturer
     10% - mark you award yourself
     10% - mark you get for doing the assessment (i.e. marked by the lecturer)

EXERCISE 3 – EVALUATION OF THE PROCESS

Having completed the two marking exercises, you will be asked to spend a short amount of time evaluating the assessment exercises. Like all evaluations, you will not directly benefit from completing the evaluation form provided, but you have in fact benefited from the evaluation having been completed by students last year. This evaluation is an important component in my educational research into assessment issues, and I greatly appreciate your honest input here.

EXERCISE 1: PEER ASSESSMENT – CRITERIA SHEET

Criteria–style, layout, presentation	Y/N	Comment/ suggestion (here or on essay)	Mark
Introductory (first) paragraph • Does it introduce the topic? • Is it clear from the introduction what the essay is about?			Out of 5
Concluding (last) paragraph • Does it summarise and follow from the main argument in the essay? • Are there any new ideas (there should not be)?			Out of 5
Body of the essay • Are sentences clearly and logically written? • Does each paragraph have a single main idea? • Are paragraphs in a logical order? • Are ideas in each paragraph in a logical order? • Are diagrams used ? Are they helpful? Are they referred to in the text (they should be)?			Out of 15
Criteria – content related			
See model answer • Does the essay answer the question? • Is **relevant** information presented? • Is there good coverage of the topic? • Has material been included that is not directly related to the topic (it should not be)? • Are examples used? Are they relevant?			Out of 25

TOTAL MARK: (out of 50)

The environment that we live in plays an important role in our lives. It provides us with resources for our daily living, eg. food, water, minerals. ~~These reso~~

These resources ~~could~~ can be classified as renewable and non-renewable resources. Proper utilization of renewable resources has a positive effect on the environment. However, the consumption rate is higher than the rate at which the resource can be renewed. (In todays society). This leads to a negative impact on the environment.

Overpopulation has a negative impact on the environment. The more people, the more cows (in a rural area). This means a larger grazing area. This in turn leads to the overexploitation of grass and hence desertification.

A large population would also require a large area to live on. This leads to deforestation and destruction of natural habitats. A large population would also require a large amount of fresh water. The earth contains only 0,003% of water that is readily available for human use. Over the years overpopulation would result in the depletion of water.

However, if this large population were to save water, practise crop rotation, conserve nature, eg. plant trees, they would have a positive impact on the environment 83

Technology has a negative impact on the enviroment. It leads to overexploitation/depletion of natural resources, eg. The ~~mining~~ manufacturing of aluminium uses up a lot of water and it is also a non-renewable resource. Large companies and factories use a lot of water as a coolant. The construction of dams in some countries have been a total disaster. Constructing dams, leads to natural habitats being destroyed, ~~hundre~~ |hundreds of humans being forced to move; and floods.

Factories pollute the air and water (rivers). Motor vehicles, aeroplanes and ships also pollute the air, in turn polluting the enviromnent. Technology can also be used to create a positive impact on the enviromnent, but this is seldom practised.

Population, affluence and technology do have an impact on the enviromnent.

Exercise 1 - Model answer.

4.(a) The model of environmental degradation devised
by Ehrlich and Holden in the 1970's is
concerned with ~~the~~ how the number ~~of~~ people
(population), the amount of resources used per
person (affluence) and the amount of pollution
per unit of resources (technology), affect the
size of the environmental impact

The first part of the equation is concerned
with the size and growth of the population.
Due to the exponential growth of humans it
is easy to see why to the humans population
has already reached 6 billion people. The LDCs
(Less Developed Countries) have much larger
population numbers than the MDCs (More
Developed Countries) and, hence, are blamed for
the very high environmental impacts on the
earth.

The second part of the equation is concerned
with the amount of resources used per person.
This can be related to affluence. The more
resources used per person, the more affluent the
person is. This is the case in the MDCs, where
resource use is much higher than in the LDCs.
Consumption of resources must be reduced
due to the fact that not all resources are
renewable and even renewable resources must
be preserved (because they are ~~being~~ used up
faster than they can be replenished). ~~Unfor~~
Unfortunately, most of the natural resources 85

consumed by the MDCs are obtained from the LDCs. This exploitation means that the LDCs do not benefit from the resources of their own country but end up paying the costs (ie. pollution, toxic substances)

The third part of the equation is concerned with the <u>amount of pollution per unit of resources used</u>. This can be related to technology due to the fact that technology has a direct relationship to the amount of pollution. The MDCs possess the majority of technology and the LDCs are, therefore, at a disadvantage.
~ appropriate technology?

All these three factors (population, affluence and technology) determine the size of the impact of the environment. In the LDCs the population is large and affluence and technology very low. This is called Population Overpopulation :-

$$ \text{POPULATION} \times \text{AFFLUENCE} \times \text{TECH.} = \text{ENVIRON. IMPACT} $$
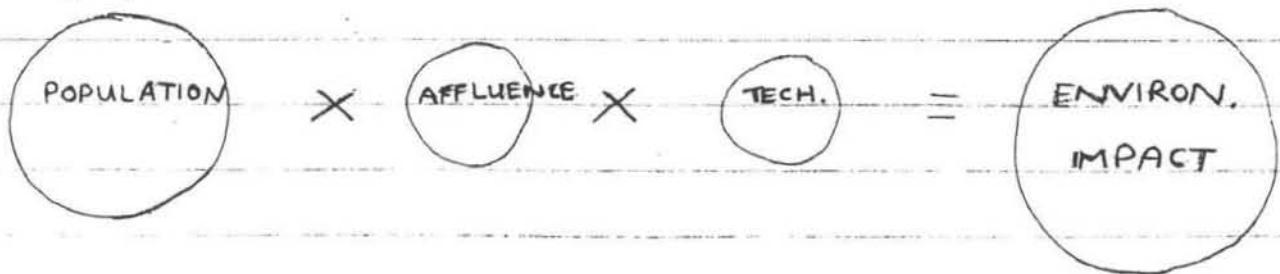
In the MDCs the population is small and affluence and technology are quite high. This is called Consumption Overpopulation :-

$$ \text{POPULATION} \times \text{AFFLUENCE} \times \text{TECHNOLOGY} = \text{ENVIRON. IMPACT} $$
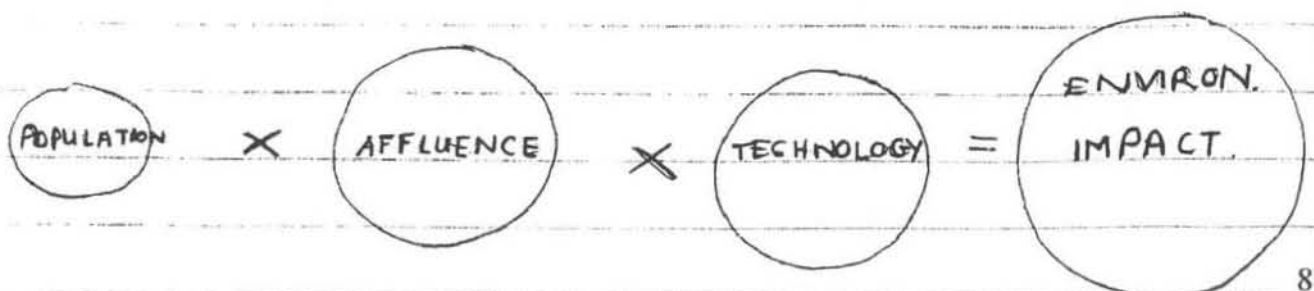
Through Erlich and Holden's model one can see that the impacts are virtually the same despite the factors being different sizes, and that in order to change the size of the environmental impact, all three of the factors have to be changed.

Excellent effort

45/5

APPENDIX 3

Evaluation sheet (first iteration)

ENVIRONMENTAL GEOGRAPHY 1
2000

EVALUATION OF THE MARKING (ASSESSMENT) PROCEDURE

Please answer all questions by ticking the appropriate category: agree, neutral or disagree

	Agree	neutral	disagree
1. I expected the kinds of questions asked in the test			
2. The questions were too difficult for a first year course			
3. The model answer helped me mark the short question			
4. The model answer helped me mark the essay question			
5. I learned some subject content by marking my own work			
6. I learned about essay writing by marking my own work			
7. I feel we should do more marking ourselves			
8. If we do more marking ourselves, the marks should count			
9. Having done this marking exercise, I will learn differently for my next test			
10. I could probably now write my own marking criteria and model answer for a set of test questions			

Any comments you wish to make?

_____

_____

_____

_____

_____

_____

_____

_____

It would help me in my research if you provided your student number. All information will be kept **completely** anonymous. However, if you not wish to provide your student number, it is also fine.

Student number:

APPENDIX 4

Test, criteria sheet and model answer (second iteration)

ENVIRONMENTAL PROBLEMS 1 - TEST 1, 31ST AUGUST 2001

Student number: ....

Please answer the question below before reading the rest of the test.

Based on the quality and quantity of time you have spent learning for this test, what mark do you think you deserve for the test? ....

SECTION A (10 MARKS)

1. From your experience, which of the soils below is likely to have a higher K factor, and why? (the attached nomograph will help you make your decision)

	Soil 1	Soil 2	Soil 3
% silt and very fine sand	60	50	40
%Organic Matter	4	2	1
soil permeability	rapid	moderate	slow

PROCEDURE. With appropriate data, enter scale at left and proceed to points representing the soil's % sand (0.10-2.0 mm), % organic matter, structure, and permeability, *in that sequence*. Interpolate between plotted curves. The dotted line illustrates procedure for a soil having: sf+vfs 65%, sand 5%, OM 2.8%, structure 2, permeability 4. Solution: K=0.31
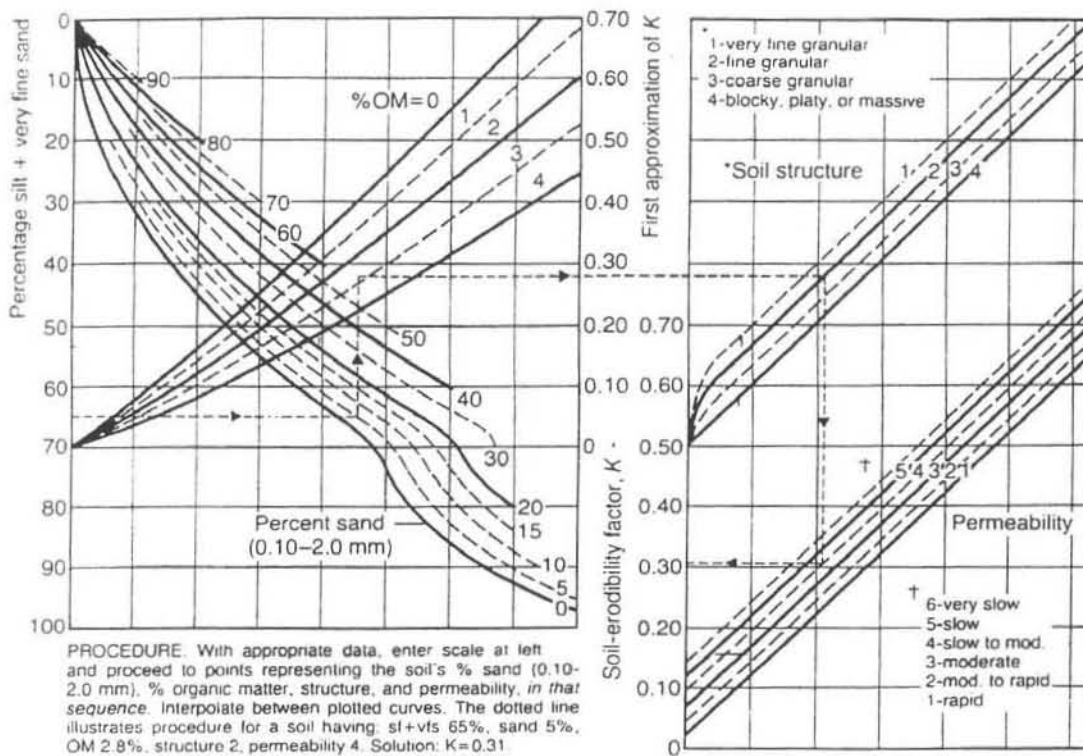
SOIL-ERODIBILITY NOMOGRAPH

SECTION B (40 MARKS)

As an environmentally conscious politician you have been approached by the National Farmer's Union to give a speech on soil conservation. Write a speech in which you explain the benefits and the problems involved with soil conservation, and try to persuade them that however difficult, it is still good practice to conserve soil.

Please answer the question below once you have completed the test.

What mark do you <u>think</u> you will get for the test? ....

PRACTICAL 4 - EXERCISE 2: SELF-ASSESSMENT (MARKING OWN TEST)

Please return this test assessment sheet **with** the test script. You may write feedback comments on the test script as well.

Student number: ....

Comments on **paragraph** question.

Criteria	Y/N	Comment/ suggestion (here or on essay)	Mark
Writing style • Are sentences clearly and logically written? • Are ideas in a logical order?			Out of 2
Content (see model answer) • Does the paragraph answer the question? • Is **relevant** information presented? • Is there good coverage of the topic? • Has material been included that is not directly related to the topic (it should not be)? • Have examples been used? Are they relevant?			

Total mark (out of 10)   ....

Comments on **essay** question

Criteria–style, layout, presentation	Y/N	Comment/ suggestion (here or on essay)	Mark
Introductory (first) paragraph • Does it introduce the topic? • Is it clear from the introduction what the essay is about?			Out of 5
Concluding (last) paragraph • Does it summarise and follow from the main argument in the essay? • Are there any new ideas (there should not be)?			Out of 5
Body of the essay • Are sentences clearly and logically written? • Does each paragraph have a single main idea? • Are paragraphs in a logical order? • Are ideas in each paragraph in a logical order? • Are diagrams used? Are they helpful? Are they referred to in the text (they should be)?			Out of 15
Criteria – content related			
See model answer • Does the essay answer the question? • Is **relevant** information presented? • Is there good coverage of the topic? • Has material been included that is not directly related to the topic (it should not be)? • Have examples been used? Are they relevant?			Out of 25

TOTAL MARK: (out of 50)

ENVIRONMENTAL PROBLEMS
TEST 1 – MARKING GUIDELINE

Question 1

The K Factor is an erodibility index used in the Universal Soil Loss Equation, a model used to measure soil erosion. The higher the K Factor, the more susceptible a soil is to erosion. The K factor of a soil is calculated from particle size characteristics, organic matter (OM) content, soil structure and soil permeability. Examining the nomograph it can be seen that the lower the % silt and fine sand, the lower the organic matter content and the slower the permeability, the larger the value of K. Fine materials lend cohesiveness to a soil. It is therefore to be expected that a soil with a low % of silt and fine sand would not be cohesive and thus susceptible to erosion. OM tends 'hold on' to (retain) moisture and to add cohesiveness to soil. Therefore a soil with low OM content would be more likely to erode. With slow permeability, water is more likely to stay on the soil surface and run down slope, causing erosion. With this in mind, soil 3 with its low % silt and very fine sand, low organic matter content and slow permeability will have the highest K factor. In contrast, soil 3 has the lowest K factor and soil 2 intermediate values.

Question 2

Good soil is essential for a productive and healthy farm. Unless farmers conserve the soil and prevent soil degradation, their farms will, in the long term, become unproductive. Today I will be taking a look at what we mean by the term soil degradation and the results of soil degradation. From this analysis the benefits of good soil conservation practices will be clear. However, despite the many obvious benefits farmers are often reluctant to implement soil conservation measures. I will discuss the reasons for this reluctance, and hope to persuade you, the farmer, that it will be in both your own interests as well as the long-term interest in the environment, for you to conserve your soils. Incentive schemes that may encourage soil conservation will also be suggested.

Poor farming practices can rapidly degrade a soil resulting in soil erosion, salinisation, chemical pollution and/or compaction. Since soil erosion is the most visible and most common form of soil degradation, I will concentrate on it here. Soil erosion can have effects both at the site of farming (onsite effects) or away from it (offsite effects).

The main negative offsite effect of soil erosion is the accumulation of soils on different parts of the landscape where it is not wanted. This can result in land being made unproductive as well as result in loss of storage capacity in reservoirs when they silt up. Another offsite impact is the clogging up of roads and drains etc. These effects are costly to rectify.

Perhaps of more interest to yourselves are the onsite effects of soil erosion, which are numerous. Firstly, there is less soil in the eroded sites, and often the soil that is lost to erosion is the more productive topsoil. Secondly, the soils hold less nutrients. This is because the finer particles, which are important in maintaining the Cation Exchange Capacity (CEC) of the soil are removed first during erosion. The CEC is a measure of the soil's ability to hold onto plant nutrients. Eroded soils have a low CEC and hence hold few nutrients for the crops. Both of these factors, less soils and less nutrients, result in lower crop yield as well as lower protein content within the crops. This will have obvious economic implications for any farmer. Furthermore, if the soil erosion processes are allowed to continue, land can eventually become totally unproductive – a process referred to as desertification. Another onsite effect of erosion is a general loss of biodiversity.

Onsite soil degradation problems apart from soil erosion can also occur. Firstly, poor irrigation practices can result in the salinisation of soils. Secondly, incorrect use of fertilizers can result in chemical pollution of the soils with the soils becoming toxic to crops. Thirdly, poor use of heavy

machinery can result in <u>compaction</u> of the soil. All of these practices will render the soils less able to support crops.

From the above analysis of problems associated with soil degradation, the benefits of soil conservation are obvious: long term productive, stable soil that can produce both high yield crops as well as high quality crops. The question I would like to address now is: why do many farmers not have soil conservation measures in place?

Firstly, it is recognised that soil erosion in particular is a natural phenomenon, and that one cannot completely prevent it. Secondly, it is difficult to measure the extent of soil erosion, and as a result farmers are not always aware of the extent of soil loss. Thirdly, and perhaps the most important factor, relates to economics.

It can be shown that with the same input costs, yield is much higher on an uneroded soil compared with that of an eroded soil (Fig. 1). But, measures to <u>prevent</u> soil erosion such as contour ploughing and diversion terraces are expensive and it is well known that the economic benefit to the farmer for conserving the soil only comes after a certain period of time (Fig. 2). If time t on Figure 2 is 2-3 years for example, it is likely most farmers would recognise that it would pay to conserve the soil. However, time t is usually much longer and farmers do not get any economic benefit themselves by conserving soils. Instead the benefit goes to later generations of farmers. The short term monetary gain is usually of more interest to the farmer than the long term conservation of soil for others (unless perhaps it was for later generations of their own family).

It has been shown that it is good practice, both for farming as well as long term survival of humans on the planet, to conserve soil. Since there are no immediate monetary benefits for farmers to conserve soil, I am proposing to parliament the introduction of an incentive scheme in which farmers receive financial reward for their soil conservation efforts. This would offset the losses they would otherwise have incurred. In this way, both the farmers benefit from their good practice in the short term, and the environment and all beings will benefit in the long term. A further legislative change I would like to see is that of the land tenure system in which ownership of land by small-scale farmers that have live on the land for many years is allowed. This would ensure better farming practices by these farmers. Obviously, current owners would need to be compensated at market related prices.

Today I have highlighted the problems associated with poor farming practices and the benefits of good soil conservation have also been addressed. Since it is recognised that economics play a major role in preventing soil conservation being implemented, it has been suggested that economic incentives be put in place to change this. In this way the farmer will benefit in the short term and humanity as a whole will benefit in the long term through having a productive environment in which to live.
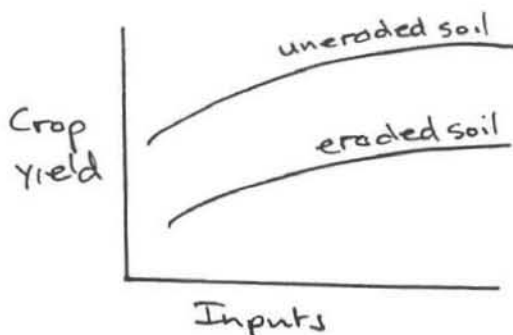
Figure 1: Crop yield on eroded and uneroded soils
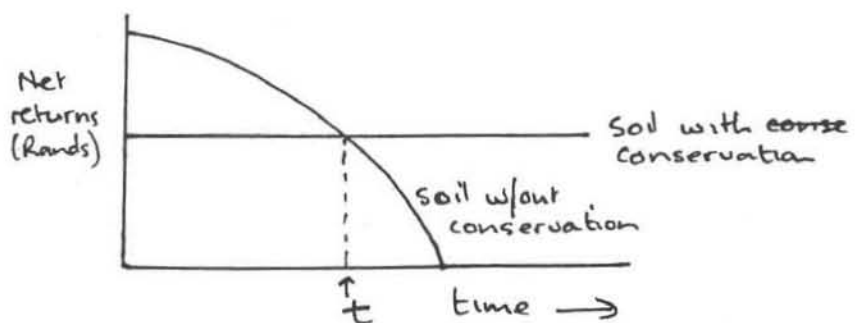
Figure 2: Net financial returns over time on soils with and without soil conservation methods.

APPENDIX 5

Tutorial one (second iteration)

TUTORIAL 1: WRITING ESSAYS 1
IS THE WORLD OVERPOPULATED?

AIM:

To write a good introduction and conclusion to an essay, as well as consider issues associated with environmental degradation.

OBJECTIVES:

By the end of this tutorial students should be able to:

- Critique introductions and conclusions for an essay
- Write a good, clear introduction and conclusion for a particular essay topic
- Identify some causes of environmental degradation
- Discuss the question of overpopulation in South Africa

INTRODUCTION

The human population has a great capacity for growth. The population is at present approximately 6 billion, and at the current rate of increase will double in the next 45 years! Humans, particularly in the first world countries, also have an enormous capacity to utilise resources. Environmentalists and scientists believe we are depleting and degrading the earth's natural capital at an accelerating rate as our population and demands on the earth's resources and natural processes increase exponentially (Tyler-Miller, 1998). As a result are we impairing the sustainability of the planet's life support system for both humans and other species? Is there anything we can do about this? These are issues we will be discussing in this tutorial.

EXERCISE 1 – WRITING AN ESSAY: INRODUCTION AND CONCLUSION

You will have written many essays during your school and University careers. During the next few tutorials we will be building upon the essay writing skills you have already attained by looking both at the *process* of essay writing (how you go about it) as well as at the *product* of the essay (what the essay itself is about). In this tutorial we will take a look at some aspects of the essay product.

An essay needs a good start (title and introduction) and end (conclusion), with lots of support material in the middle (body of the essay). The following Box states very briefly what is expected in each.

BOX 1 – ESSAY STRUCTURE, PRESENTATION AND STYLE

TITLE:
- Brief but descriptive

INTRODUCTION:
- Provides background information to the topic
- Tells reader what is in the essay

ESSAY PARAGRAPHS:
- Each paragraph has a single main idea
- Paragraphs should be in logical order
- There should be 'flow' from one paragraph to the next

CONCLUSION:
- Sums up the arguments of the essay
- Does not directly repeat statements from the introduction
- No new ideas are presented

REFERENCES/BIBLIOGRAPHY
- List of material used in writing the essay

OTHER CONTENT, WRITNG STYLE AND PRESENTATION ISSUES:
- Each sentence clearly and logically written
- Written in an 'academic' and not a 'journalistic' style
- All relevant information is present
- Irrelevant information is left out
- Diagrams and figures are acceptable where appropriate
- Use examples where possible

1.1 THE INTRODUCTION TO AN ESSAY

Read the three essay introductions below. Comment on each individually and in detail, highlighting good and bad points. (Source: Kneale, 1999)

The essay title for the introductions is as follows:

"Discuss the impact of humans on Canadian wetland landscapes in the last 100 years"

Version 1
Wetlands can be described as transition zones between terrestrial landforms and water bodies. They resemble both uplands, due to their ability to support emergent plants, and aquatic regions because of the domination of the areas by water. Even though these highly productive areas contribute 14 per cent of Canada's total land surface, they were not thought of as having potential until the end of the last century because they made transport difficult whilst at the same time harbouring many deadly diseases.

Version 2
Due to the ever-increasing population and rapidity of land use change the prevalence of wetland areas (wetlands are a transition between landforms and water bodies) is depleting. Within urban areas wetlands are often the last to be developed and as cities have expanded through this century there has been a rush to fill these in too. It is man's impact that particularly over the last century has influenced them most. Many have been depleted due to their site near to main rivers, coasts and bays, and therefore have been developed due to their necessary use for transportation. The conversion of lakes and reservoirs has also added to this. This essay will examine some of the impacts on wetlands in the last 100 years.

Canadian wetlands are extensive but vulnerable to exploitation and reclamation (Environment Canada 2010). The pressures of agriculture, drainage schemes, urban development, forestry and peat harvesting have significantly reduced their extent and this has had an impact on the wildlife which use wetlands as permanent or migration habitats. This essay will assess the extent and processes of change using examples from wetlands across Canada, and then focus on the particular issues raised by the Copetown Bog near Ontario. As this case reveals, there are grounds for optimism as the significance of wetlands, and the need to conserve them, are nationally and internationally recognised.

Version 1: Comments (4 marks)

Version 2: Comments (4 marks)

Version 3: Comments (4 marks)

1.2 CONCLUSION

Read the four essay conclusions below. Again, comment on each individually and in detail, highlighting good and bad points.

Version 1

It is therefore possible to see that people have had a mega impact on the landscape as the land devoted to agriculture quadrupled and there was an explosion in urban development. This impact was caused by the discovery that wetlands have many important values and perform many worthwhile functions. The components of the system are seen to be interconnected, and that destruction of one part of the system will have effects, probably adverse elsewhere in the system. This has meant that for the last 25 years there has been less damage, but only a great deal of time and conservation will reverse the extraordinary exploitation that has occurred on Canada's wetland landscapes.

Version 2

All in all, there has been a lot of pressure on Canadian wetlands over the past hundred years due to human impact, but things look set to improve, with talk, and actions, of restoring many wetlands areas, and also new international regulations and laws for their protection.

Version 3

In addition to the impacts I have considered, threats likely to continue or increase include the harvesting of black spruce (*Picea mariana*), use of wetlands for wastewater treatment, burning which may lead to the loss to native species and the invasion of Eurasian weed species, and increased accumulation of sulphur and heavy metals from acid rain. The impact of people has led to the loss, or serious degradation, of these vulnerable ecosystems which are effectively a non-renewable resource. The recreation and educational value of wetlands has been discussed. There is a dilemma for managers here, who need to protect the ecology of sites while giving appropriate access for eco-tourists, hikers, ornithologists, fishermen and hunters. Good et al. (1978) pointed out that much wetland management derived from common sense rather than science. In 1999 the science base has increased, the complexities of ecosystems interactions are better understood. The RAMSAR Convention has provided valuable guidelines for wetland preservation but there is still much to be done to prevent further wetland destruction.

Version 4

Canadian wetlands were drastically altered by the intervention of humans. Seventy per cent have been reclaimed for a variety of purposes including agriculture, urban development, industry, energy development and harvesting. There is a consequent loss of habitat and reduced species diversity. Recent changes in human use of wetlands have led to some abandoned agricultural sites being returned to wetland but agriculture is still the dominant activity.

Version 1: Comments (3 marks)

Version 2: Comments (3 marks)

Version 3: Comments (3 marks)

Version 4: Comments (3 marks)

1.3 YOUR OWN INTRODUCTION AND CONCLUSION

Read the material provided at the end of this tutorial. Having been asked to write an essay entitled:

"The population is the main cause of environmental degradation"
Discuss this statement"

provide a well thought-out, well-structured **introduction** for this essay title.　　(10 marks)

Although you do not need to write the essay in full, think carefully about what you would write in the main body of the essay. Now, write a **concluding paragraph** for the above essay title. (6 marks)

EXERCISE 2 – OVERPOPULATION IN SOUTH AFRICA?
Using the material provided, as well as your own knowledge of south Africa, try to explain why the author B Klugman feels there should be a resources policy in SA rather than a population policy. You do not need to write this, but it will form the basis for your tutorial discussion.

References:
Kneale, P (1999) Study skills for Geography students. Arnold, New York

Tyler-Miller, G (1998) Living in the environment: Principles, connections and solutions. 10th ed. Wadsworth, New York.
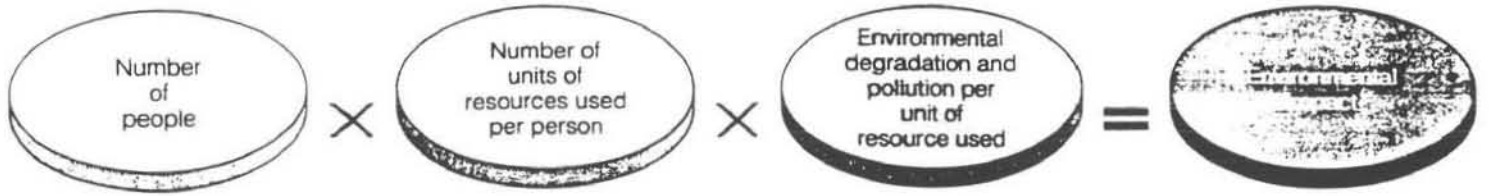
Figure 1-15 Simplified model of how three factors—population (P), affluence (A), and technology (T)—affect overall environmental degradation and pollution, or the environmental impact of population.

People Overpopulation

| Number of people | Number of units of resources used per person | Environmental impact per unit of resource used | Environmental impact |
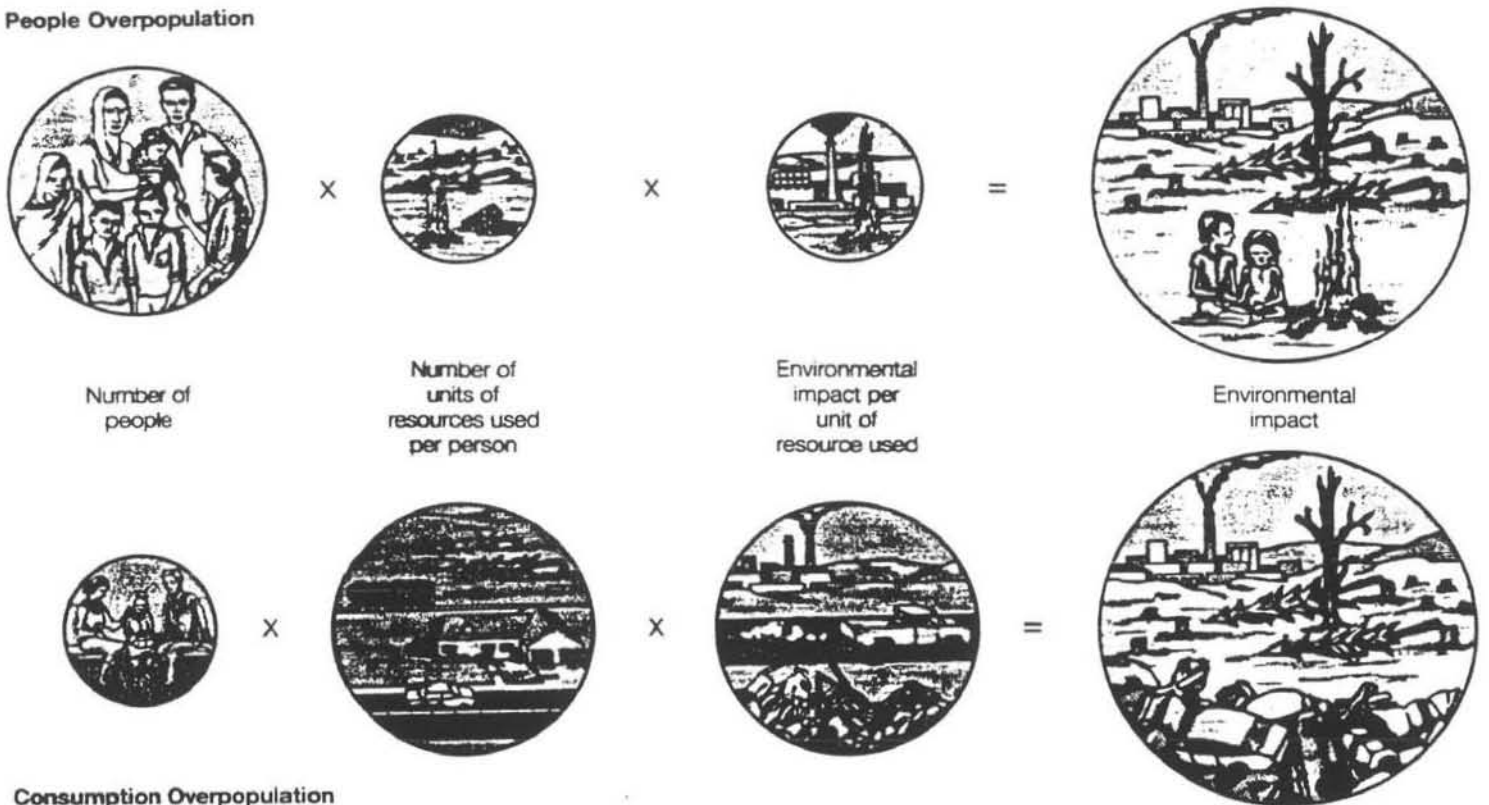
Consumption Overpopulation

Figure 1-16 Two types of overpopulation based on the relative importance of the factors in the model shown in Figure 1-15. Circle size shows relative importance of each factor. People overpopulation is caused mostly by growing numbers of people. Consumption overpopulation is caused mostly by growing affluence (resource consumption).

ROOT CAUSES
- overpopulation
- overconsumption of resources by the affluent

- *Poverty or underconsumption of resources by the poor.* This is a result of our failure to achieve a more just distribution of global income (Figure 1-6) that meets everyone's basic needs.

- *Inefficiency.* This involves massive waste of energy, water, and other resources.

- *Addiction to fossil fuels.* This applies especially to oil and coal.

- *Oversimplification of Earth's life support systems.* The key factor here is excessive reduction of biodiversity.

- *Poor political and economic management.* This involves our failure to encourage Earth-sustaining forms of economic development and discourage Earth-degrading forms of economic and population growth.

- *Failure to have market prices represent the overall environmental cost of an economic good or service.* This promotes inefficiency and depletion of Earth capital for short-term profit by concealing the harmful effects of the products we buy.

- *Our urge to dominate and control nature.*

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Klugman, B (1991) Victims or villains? Overpopulation + environmental degradation. In: Going Green. Eds J. Cock + E Koch. OUP, Cape Town.

Conclusion

All societies need a balance between resources and population. In South Africa, that balance has been destroyed by apartheid policies and through this process, major environmental problems have been created.

It is easy for these problems to be blamed on overpopulation, but this approach is both ahistorical and dishonest. It is not population numbers that threaten South Africa, but the lack of access to resources on the one hand and the overconsumption of resources on the other. It is not the poor themselves who have caused their poverty by having many children, but the practice of discrimination — which has denied them access to resources and security and in so doing, has caused the birth rate to increase.

Nowhere in the world has the mass provision of contraceptives led to a decrease in the population growth rate in the absence of an improvement in women's position in society, and an improvement in the overall standard of living. It is now internationally recognized that as people's standard of living improves, and as they are able to exercise increasing control over their lives, so they choose to have fewer children (United Nations, 1975.)

Two specific and crucial factors in improving the overall standard of living of the population are education and health care. In particular, giving women access to education is critical to their empowerment and is the major factor leading to a decline in fertility (Sai, 1986).

Likewise, a central part of primary health care services is the focus on mothers and children — the provision of health education, contraception, infertility services, immunization, and ready access to clean water. All of these enhance the quality of people's lives and as a result, lead to a decline in fertility.

'This understanding of the population-resources question leads me to conclude that what South Africa needs is not a population policy, but a resources policy. The solution lies, among other things, in a concerted and democratic effort to use South Africa's resources in a constructive, environmentally conscious manner. Such a national development policy would improve not only the standard of living of the poor, but also the degree of control which they have over their lives.

GAVIN YOUNGE

BELOW
A malnourished child in a rural clinic

> Nowhere in the world has the mass provision of contraceptives led to a decrease in the population growth rate in the absence of an improvement in women's position in society
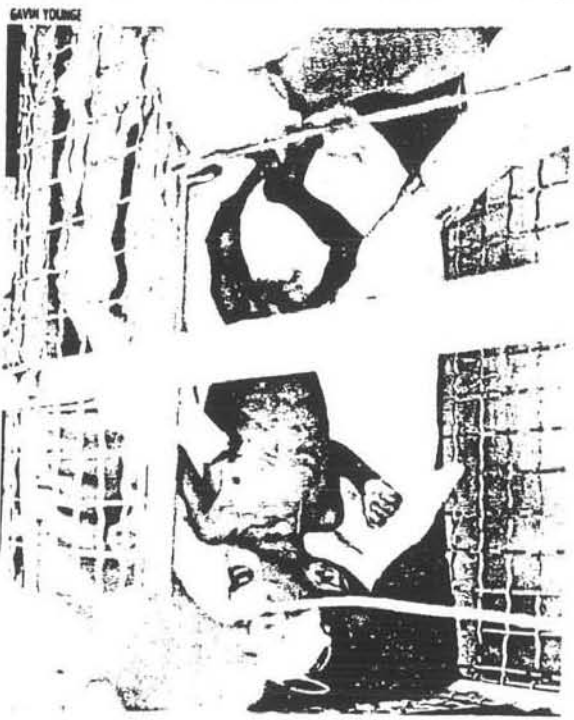

Figure 4.17 Controlling our population and resources—there may be more than one side to the issue.
Source: Asian Cultural Forum on Development.

The question of numbers

Every child that is born needs education, food, water, clothing, shelter, transport, health care, recreational facilities, and later, a job.

This translates into the consumption of a lot of natural resources over a lifetime. The growing population uses ever more water, land for agriculture, meat production, roads and housing, and resources such as coal, oil, wood, steel, cotton, and paper. In 30 years time there will be twice as many people on the planet, eating three times as much food and using four times as much energy. With the Earth's carrying capacity already strained, it is likely that more people will face famine, and wars will increasingly be fought over ever scarcer resources like land and water.

Rapid population growth in Africa means that economies must grow by 3% per annum to maintain constant incomes. South Africa's economy needs to grow by a minimum of 5% per annum just to stop unemployment increasing. SA has had a negative growth rate for several years, and the economy would need to grow by an average of 7 — 8 percent per annum over the next 10 years to provide jobs and a decent standard of living for all its people. This is unlikely to happen.

South Africa's arable land and water resources are already under pressure. Both are scarce: only 10% of the land in South Africa is considered arable and even less has high agricultural potential. Most cities and industrial areas are on good agricultural land, decreasing land available to grow food for the growing population.

Rapidly growing populations, such as those in Africa, have a majority of young people. Over half South Africa's population is under fifteen, placing a great burden on the economically active to feed, clothe, house and educate so many children. It also means that the population level will take some time to stabilise, as the present generation have still to produce children. It is important to show the youth the benefits of smaller families. ∎

The question of consumption

Over consumption and waste of resources in the North and by the wealthy minority in the South is a serious threat to the global environment. Eighty percent of current consumption of resources is attributed to 20% of the Earth's population. The average European's lifestyle produces 2 000 times more toxic waste than that of the average African subsistence farmer. If these levels continue, the 57 million people born into a high-consumption lifestyle in the 1990s will pollute the Earth more than the 911 million born during the same period in the South.

Apart from the global effects of over consumption in the North, such as increased carbon dioxide levels, stratospheric ozone depletion and toxic effluents, this consumption also degrades the environment in the South. Japan reached its 30 million population limit, in terms of natural resources, in the eighteenth century. Today it supports a population of 130 million — by importing raw materials from its developing neighbours.

The world's largest consumer of tropical forest products, Japan is the main cause of rapid deforestation in Thailand, Indonesia, Phillipines and Malaysia. Japan exports industrial pollution world wide in the form of metallurgical processing plants, car and electronic assembly plants, and chemical industries.

Exploitation of natural resources to promote industrial growth can negate the positive impact of decreasing population growth. Thailand has reduced its fertility rates by half since the 1960s, but its environment continues to be degraded by industrialisation and severe soil erosion from logging -developments spearheaded by Japanese firms.

Everyone needs to contribute to global environmental sustainability, but the over consumers need to contribute more, and sooner, than the under consumers. ∎
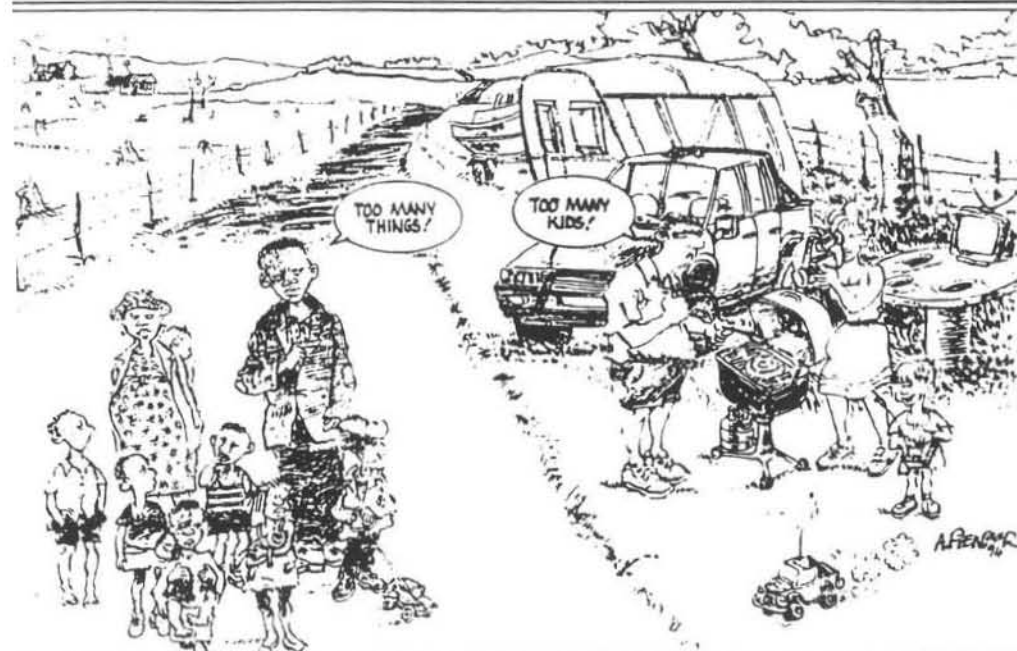
High medium and low long term population projections are based on differing assumptions. The UN projection of 10.2 billion assumes a global fertility rate of two children per woman in 2035.

14.2 billion

10.2 billion

7.5 billion

2.5 billion

1950 1975 2000 2025 2050 2075 2100

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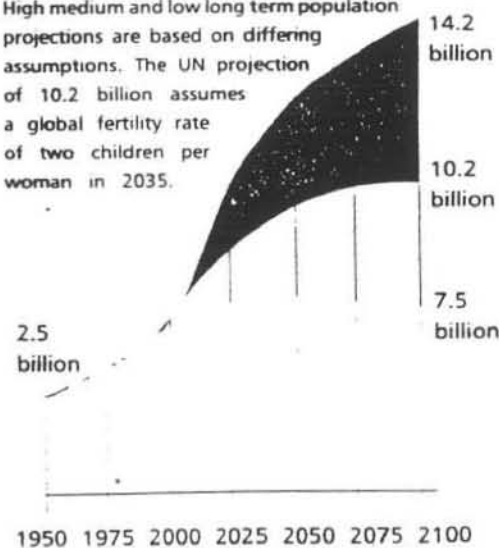
South Africa & the World

South Africa's population is approaching 40 million, with an average annual growth rate of 2.3 percent. Over 2 100 people are born every day. The average fertility rate (the number of children born to each woman) is between four and five. Three for urban, six for rural women. At this rate the total population will double in 20 to 30 years.

Although South Africa's population growth rate is lower than most other countries in sub-Saharan Africa, it is far higher than the industrialised countries (0.6 percent) or even the world average of 1.6 percent.

The causes of South Africa's high population growth rate resemble those in the rest of the world — high illiteracy, especially among women, poverty and the low social standing of women in society.

South Africa's uniqueness lies in the way apartheid entrenched inequality among different sectors of the population in law — denying the majority access to land and services like water, education, and health care. Unpopular and insensitive government departments have tried unsuccessfully to promote contraception and family planning, creating hostility to these practices. Meanwhile, the white minority elite occupy most of the land, drive most of the cars, and consume most of the electricity.

Global population

World population is now 5.42 billion and is expected to reach 7 billion by 2010. China has the largest population, at 1.16 billion, followed by India (882 million), USA (255 million), Indonesia (184 million), Brazil (150 million), Russia (149 million) and Japan (130 million).

A recent study shows that birthrates in nearly every nation in northern and western Europe, in Canada and the USA, Australia and New Zealand are rising, after reaching record lows in the 1980s. There are several causes including immigrants who favour larger families, and the high numbers of divorced people remarrying and starting new families. Rich countries that had relatively high birth rates such as Italy and Spain have shown recent sharp drops. Italian women now bear an average of 1.26 children, while the Spanish average is 1.24. This is well below the population replacement level of 2.1. Scientists attribute these drops to legalisation of birth control and abortion, higher numbers of working women and a desire for smaller families.

Worldwide, women average four children, though in parts of Africa the average is as high as eight or 10.

The biggest recent drop in birth rates is in Latin America and east Asia. Korea's fertility rate has fallen from an average of 6.1 per woman to 2.1 over the past 25 years. Sri Lanka's dropped by nearly 40 percent between 1960 and 1985, to 1.4 percent, despite a low per capita GNP. The drop is attributed to the government's policy of addressing the needs of the poor, providing free and subsidised basic foods, and promoting education and jobs for women. This reduced infant mortality, increased life expectancy and raised the adult literacy rate to 87 percent.

China, with the largest population on Earth has legislation limiting couples to one child. Population growth is now close to zero, with an average of two children per woman.

Such drastic measures have had far-reaching social consequences. Girls, always discriminated against, are suddenly even less desirable. Abortions of female foetuses are common. Men now outnumber women, and there are fears that hundreds of thousands of men will be unable to find wives. This may increase existing problems of abductions, forced marriages, and slavery of women and young girls.

In general non-voluntary and coercive programmes have had unfavourable political and social consequences. Bangladesh, Mexico, Puerto Rico and India are among countries that have tried such programmes.

Not all peoples are growing in numbers. Many indigenous groups face the threat of extinction. There are now around 300 000 Aboriginal people in Australia, down from an estimated one to two million two hundred years ago. Brazilian tribes face similar declines due to exposure to previously unknown diseases and loss of lands and traditional lifestyles. ■

South Africa compared to countries with the fastest and slowest population growth rates (Source: population reference Bureau, Washington DC)

	Birth rate (per 1,000)	Death rate (per 1,000)	Natural increase (percent)	Fertility rate (per women)	Infant mortality rate	Per capita GNP (US$)
Kenya	46	7	3.8	6.7	62	360
Ivory Coast	51	14	3.7	7.4	96	740
Zambia	51	14	3.8	7.2	80	290
Tanzania	51	14	3.7	7.1	106	160
South Africa	34	8	2.25	4.5	73	2,530
West Germany	11	11	-0.0	1.4	7.5	18,530
East Germany	13	13	0.0	1.7	8.1	n.a.
Bulgaria	13	12	0.1	2.0	13.5	na
Italy	10	9	0.1	1.3	9.5	13,320
Sweden	14	11	0.2	2.0	5.8	19,150

South Africa's infant mortality rate is double that of countries with similar GNP per capita levels. With high illiteracy rates, particularly amongst women, low status for women, poor basic health services and unequal distribution of wealth and resources, South Africa scores badly in most areas regarded as critical for the achievement of low population growth rates.

Further reading: Walden Bello, Population Control - the real culprits and victims, *Third World Resurgence* no 33, May 1993
Paul Harrison, *The Third Revolution - population, environment and a sustainable world*, Penguin, 1992

What causes high birth rates?

Poverty and social inequality

When women and children lack health facilities, clean drinking water and sanitation, birth rates are likely to be high. If a woman is afraid of losing children to malnutrition or common childhood diseases, she is likely to bear more, to ensure that some reach adulthood. As a result poorer, less educated people, those least able to afford big families, generally have many children.

This often leads to tremendous hardship. Poorer families favour boys when it comes to education. This limits opportunities for girls, ensuring that their social status remains low and is linked to motherhood. The downward spiral continues. Many families cannot cope with the stresses and children end up on the streets, unloved and uncared for. Around the world there are an estimated 100 million street children.

South Africa has an infant mortality rate of 73 per 1000 live births, 38 more than the world average for countries of comparable wealth. Only 63% of SA children are immunised against measles, a killer disease among poor, undernourished children. Lack of clean drinking water and sanitation in rural areas and informal settlements also take their toll. Sub-Saharan Africa averages 183 infant deaths per 1000 live births, while that for the world is 97.

Status of women

In paternalistic societies it may be hard for a woman to tell her husband that she does not want to bear more children. In South Africa, migrant labour and traditional culture mean that men may have more than one wife, and up to 20 children. Many children may be an important social indicator of a man's virility, or status. In rural areas, women and children work the fields, collect firewood and water, and tend younger children and the elderly.

Women number half the global population, their earnings are one tenth of men's, they own 1 percent of property and are two-thirds of the world's illiterates. They do most of the labour. Even in developed countries, women earn less than men for the same work.

Global economic systems

Cash crops replace food crops and fragile soils are degraded as developing nations struggle to service debts they cannot repay. Trade barriers in developed countries and depressed prices for primary products force them further into debt. Economic structural adjustment programmes (ESAPs) force poor countries to reduce spending on social services. The result is an ever-deepening cycle of poverty, ecological degradation, illiteracy and high population growth. ∎

Solutions

Inequality and poverty go hand-in-hand with high fertility rates, while rising living standards and incomes generally ensure a lowering of population growth rates. However, rapid economic growth in pursuit of the northern model is not the answer. While industrialisation and economic growth there have led to lower birth rates and stable populations, the high levels of consumption negate any positive environmental benefits.

In southern countries where population growth rates have come down in situations of moderate economic growth, increasing average national income has not been as important as the extent to which increased income directly benefits ordinary people, especially women.

Women need better social status, economic rights and access to education. Walden Bello of Food First points out that investments in female education have some of the highest returns for development and the environment. In countries where few women receive secondary education, the average woman has seven children, but where 40 percent of women have secondary education, the average drops to three children, even after controlling for factors such as income.

Access to birth control is every woman's right. Women need access to clinics and well-trained and sympathetic health-care workers. Planned parenthood ensures that each child is wanted and provided for. With fewer children and longer intervals between births, mothers and children are healthier and child mortality rates drop.

It is important that birth control programmes allow free choice and access to health care and education and are not imposed by government.

Above all, we need to remember that lowering birth rates alone will not stop the planet sliding towards ecological ruin. Just as crucial is the need for the rich to lower consumption levels drastically. Clean and renewable energy, recycling, waste reduction and appropriate technologies need to become the norm rather than the exception.

Short and long term

Population growth increases environmental impact in many ways. Slowing that growth reduces the damage. But action now will only produce effects in 20 or more years. In the shorter term, other measures will have a greater impact — reducing consumption, using sustainable technologies, halting deforestation, attacking poverty and inequality, introducing land reform.

In the medium to long term, reducing population growth can have a big impact. To do this, governments and development agencies need to focus attention on enhancing the rights, education and health of women and children. This will improve the well-being of people and the environment. And because results are slow in coming, action is needed now.

In nature, when the population of a species grows until it is out of balance with its surroundings, there is a die off due to disease, predation, lack of food, or decreased fertility rates. We must remember that the human race is a species of animal. The only difference is our ability to reason and therefore change.

Perhaps there is time to control our numbers, and our destructive patterns of behaviour and consumption. If we cannot, Mother Nature will do it for us on a global scale. Sadly, before we go, many other animals and plants will have disappeared. ∎

APPENDIX 6

Tutorial two (second iteration)

AIM:

To provide a good essay plan as well as recognise and be able to debate the environmental issues associated with the forestry industry.

OBJECTIVES:

By the end of this tutorial students should be able to:

- Provide a detailed plan, in the form of a spider diagram, for an essay.
- Identify environmental issues associated with the forestry industry.
- Argue these issues effectively in a debate.
- Appreciate that the same set of facts (data) can be viewed in very different ways depending upon the person's perspective (world view).

INTRODUCTION

Exotic trees such as gum, pine and wattle are planted across large tracts of land in South Africa where the climate and soils are suitable. These trees are used locally to make paper and produce timber products, and the wood is also exported for use overseas. There are contrasting views as to what effect and how much of an effect the forestry industry has on our environment.

You have been provided with two readings associated with this issue. The first, by the environmental journalist Maria Johns, refers to the plantations as "green wastelands" and states that some plantations destroy biodiversity, waste our water resources and are a threat to ecotourism. The second article by Susan Celliers, which is a response to the first article, states that plantations are a renewable resource, they improve air quality, enrich soil and prevent soil erosion, and that the the forestry industry has contributed to many environmental, conservation and ecotourism initiatives.

EXERCISE 1: PLANNING AN ESSAY OF YOUR OWN – THE PROCESS

An essay is not merely a collection of recalled facts. To write an essay you have to re-organise information and put facts together in a NEW WAY according to a particular THEME. The material needs to be ORDERED and LINKED in a way that follows the theme, and is clear to the reader (see pages 18-23 of your GUIDELINES book).

The following Box suggests a process for planning and writing an essay.

BOX 1: PROCESS FOR PLANNING AND WRITING AN ESSAY

- <u>FAMILIARISE</u> yourself with the material
- <u>RECALL</u> and write down as many key words as possible that may have anything to do with the essay in question
- <u>RE-ORGANISE</u> the information you have recalled by thinking about what you are required to DO with the key words so that you will follow the theme of the essay
- <u>PLAN</u> an outline of the essay by grouping key words together under specific headings, to form a hierarchical list or a mind map (see pgs 28 & 29 of your GUIDELINES book)
- <u>EXPAND</u> the topics in your essay plan, preferably one paragraph per topic
- <u>CHECK</u> that each paragraph is built on one main topic or concept, and <u>MODIFY</u> if necessary
- <u>CHECK</u> that the information flows well from one topic (paragraph/section) to the next, and <u>PROVIDE LINKS</u> where necessary
- <u>ROUND OFF</u> the essay by writing an INTRODUCTION and CONCLUSION

1.2 - PLANNING AND PROCESSING INFORMATION

Read both articles on the forestry industry and decide which side of the debate you would like to argue:

"The forestry industry has many benefits for the social, physical and economic environment" .
OR
"The forestry industry is harmful to the social, physical and economic environment"

In the space on the following page, provide a plan of the essay either in a well ordered hierarchical list or in a mind map or 'spider diagram' (see pg 28 of GUIDELINES book) to suit the overall structure of the topic. (**NB: this must have sufficient information that the reader has some idea of what will be said in each paragraph**. For example, if you were arguing **for** the forestry industry and wanted to make the point that the industry has found ways to improve yield – there are at least six points that can be made under this heading and each should be mentioned briefly by using key words. Examples can be mentioned too. If you feel a single page is too small for your essay plan, you may do it on a separate, larger sheet of paper to be handed in).   (30 marks)

You will be having a debate on this issue in the class. Come prepared to participate actively in the debate.

Source: African Environment & Wildlife. Vol 1, No 3 (1993)
Vol 2, No 1 (1994)

ESSAY PLAN:

ARE ALL TREES GREEN?

The spotlight on forestry

TEXT BY MARIA JOHNS

The South African forestry industry would like us to believe that their plantations are good for the environment. Yet conservationists argue that the same plantations destroy biodiversity, squander our precious water and could be a threat to ecotourism. They are nothing but 'green deserts', argue some concerned individuals, but 'green wastelands' would be more apt than a comparison with

COLIN PATERSON-JONES

A regiment of exotic pines. Note the needle-strewn plantation floor, barren but for a few straggly weeds.

deserts – there is more biodiversity in a few square metres of the Namib Desert than in an entire plantation. The way forestry is regulated, foresters could plant up the final remaining one per cent of grassland left, destroy all the Red Data species contained in this threatened biome, and there is nothing in the way the law is currently practised, to prevent them from doing so.

D on't plant a tree for Arbor Day. Pull one out', says Professor Braam van Wyk, botanist and campaigner for biodiversity. A heresy? Maybe it would sound so to some, but no-one loves trees more than Braam van Wyk and he is simply debunking the blanket notion that all trees are good. To him this is not only naive but dangerous – it may be deforestation that is destroying biodiversity in the Amazon rainforest but in South Africa biodiversity is being destroyed by too many exotic trees in the form of plantations.

'By all means plant some indigenous trees in your garden to attract birds', says Van Wyk. 'Plant trees where trees used to occur, but pull out all the alien invaders such as syringa, cluster and black wattle, especially when they occur close to rivers and wetlands.

'And don't be seduced by those green blankets of pine and eucalyptus trees that almost entirely smother the eastern Transvaal escarpment. They could be one of South Africa's biggest environmental catastrophes.'

An oribi, Ourebia ourebi, an antelope of the high grasslands, set against a dry winter landscape in the foothills of the Natal Drakensberg, an area earmarked for massive afforestation.

According to botanist Peta Masson, photographs of the Sabie area last century showed extensive grasslands and a virtual absence of plantations. Before 1875 these beautiful grasslands were home to a host of species with high levels of endemism and diversity (the majority of the 110 escarpment endemics are montane grassland species).

The blue swallow, *Hirundo angolensis*, and broad-tailed warbler, *Schoenicola brevirostris*, found almost exclusively in grasslands, were not endangered then. Also among the indigenous flora and fauna that once thrived but are now rare, are plants such as *Clivia caulescens*, *Gladiolus exiguus* var. *micrantha* and *Watsonia transvaalensis*, and animals such as the oribi, *Ourebia ourebi*, mountain reedbuck, *Redunca fulvorufula* and Gunning's golden mole, *Amblysomus gunningi*.

Then, in 1875, commercial afforestation began. Little by little the pretty alpine highlands turned into a monotonous green. The first to complain were local ▶

PETER PICKFORD

ARE ALL TREES GREEN?

The forestry industry replies

TEXT BY SUSAN CELLIER

(for the Environmental Working Group of the Forestry Council)

PHOTOGRAPHS BY LES BUSH

Critics of the South African forestry industry would have us think that plantations are merely green wastelands – a total environmental disaster. A closer look shows that forestry actually helped to initiate environmental awarenesss in this country, and that it contributes significantly to conservation and ecotourism. A renewable resource, trees

Maria John's article, Are All Trees Green? *which appeared in* Africa – Environment & Wildlife, *September/October 1993, Vol. 1 No. 3, provoked a sharp response from the forestry industry, and, as readers will already have noted, we offered the industry the opportunity to respond. This they do in the following article.* ED.

improve air quality, purify water, enrich soi and prevent erosion. With its growing emphasis on waste-paper recycling and its potential for social upliftment through smal grower schemes and through low-cost housing, forestry is an important, environmentally and socially responsible industry for the new South Africa.

'Preservation as an environmental policy is a dead duck – it's just not possible in the real world,' says a prominent environmental economist. 'Most environmentalists have finally realized that there are trade-offs.' In the real world with all its imperfections we need to find a balance between industry and conservation, development and preservation. Any change in land-use from natural grassland or bush, whether it is to maize, sugar-cane or trees, inevitably results in a reduction in biodiversity and also a change in the type of plants, mammals and birds that live in the area. If we had to import all of the maize, sugar, wood and paper products we as a society need, how could we ever hope to afford it?

To survive economically, countries have to strive for self-sufficiency, which means that some land has to be used for agriculture, forestry, industry and housing. In a country where the politically disenfranchised majority is clamouring for land reform, demanding a chance to own and run its own economically viable farms, it is unlikely that a new government will decide to set aside remaining grasslands for the benefit of overseas ecotourists who want to see the 'real Africa', regardless of the 'forex' this could earn.

One has only to look at the 'African flower garden' of multicoloured plastic packets stuck to the stubble, which is all that is left of the overgrazed grasslands in many areas, and to watch the rivers run brown and thick with soil to the sea after it rains to know that South Africa is in big trouble environmentally, and that this trouble comes from many social, economic and political sources.

Human aspirations and uncontrolled population growth re the real threats to our natural heritage, not the growth of the forestry industry. 'Over the next 20 to 30 years, the industry could double its output,' says

Mike Edwards, executive director of the Forest Own Association. But this does not mean we will double area planted. The industry has formulated a thr pronged approach to achieving this increased output.

'First, the industry's research into silviculture a tree breeding will dramatically improve yields from isting areas. All the major forestry companies plus fo or five research institutes and university departmer have scientists at work breeding new, superior clor hybrids to plant in existing forestry areas, and discov ing better methods of site preparation, weed contr and fertilization.

The possibilities for improved yields on existing sit are tremendous – 30 to 50 per cent from improve site-species matching alone according to Martin He bert, silviculturist at the Institute for Commercial For stry Research (ICFR). And fertilization at planting ca increase the harvest by four to seven tons per hectar just for wattle bark.

To that, add another 65 per cent increase from gene tic developments. Reports tree breeder Dave Jame 'The genetically improved trees grow faster, so a eight-year rotation is reduced t five years – in three cycles, yo have gained a cycle.' 'Second according to Mike Edwards, 'a increase in wood and waste-pa per recycling will significantl reduce the need to cut dow trees to produce our products.'

The forestry industry initiat ed the drive to recycle wast paper in this country by the ir toduction of consumer collec tion schemes to recover paper According to a report by man agement consultant Louis Hey some South African paperboar mills have as much as a 70 t 80 per cent intake of waste pa per, and there is a push to brin others up to this level. The re port further estimates that, cu rently in South Africa, waste paper utilization is around |

Below Forest recreation is growing in popularity. Shady canopy cover is a haven for backpackers.

APPENDIX 7

Tutorial three (second iteration)

TUTORIAL 3: ESSAY WRITING 3
GENETICALLY MODIFIED ORGANISMS

AIM

The aim of the tutorial is both to improve essay writing skills as well as to gain some understanding of issues related to genetically modified organisms (GMO's).

LEARNING OBJECTIVES

By the end of this tutorial you should be able to:

- Plan an essay in the form of a spider diagram or hierarchical map or list
- Write a brief essay on an aspect of GMO's.
- Express a reasoned opinion on issues related to GMO's.

INTRODUCTION

During this course you will be examining various aspects of biodiversity – which refers to the variety of genes, species, ecosystems and ecological processes. It is recognised that South Africa has a unique biological diversity which is of international, national and local value and significance. In a recent policy document relating to the conservation of biodiversity here in South Africa (White Paper on the conservation and sustainable use of SA's biological diversity, May 1997), the first goal was to "conserve the diversity of landscapes, ecosystems, habitats, communities, populations and genes". Of interest, the issue of genetically modified organisms (GMO's) was specifically considered as part of this goal and it was suggested that legislation be developed to ensure the safe usage of GMO's in this country. This tutorial will be taking a look at just some of the issues related to GMO's.

In this tutorial you will be reading a selection of material on GMO's obtained from the following web sites:

htp://www.thecampaign.org/
htp://www.geneticallymodifiedfood/organisms index
htp://www.easd.org.za/sapol/diversity3.html
htp://www.monsanto

Using the readings provided, and the skills you have learned in the previous two tutorials, you are required to **plan** and **write** the following essay which should be one or two pages in length.

"Describe the possible effects of GMO's on human health and the physical environment"

EXERCISE 1 - ESSAY PLAN (10 marks)

EXERCISE 2 – WRITING THE ESSAY

The criteria you will be assessed on in your essay are as follows:

STYLE, LAYOUT AND PRESENTATION:

- **Introduction**   3
  - Does it introduce the topic?
  - Is it clear from the introduction what the essay is about?

- **Conclusion**   2
  - Did it summarise and follow from the main argument in the essay?
  - Were there any new ideas (there should not be)?

- **Body of essay**   10
  - Were sentences clearly and logically written?
  - Does each paragraph have a single main idea?
  - Are paragraphs/ideas in a logical order?
  - Were diagrams need and used? Were they helpful? Were they referred to in the text?

CONTENT   15
- Did the essay answer the question?
- Was relevant information presented?
- Was there good coverage of the topic?
- Was material included that was not directly related to the topic (it should not be)?
- Were examples used? Were they relevant?

TOTAL   30

NOTE: marks are equally proportioned between style and content.
NOTE: Do NOT plagiarise. It is a very serious offence. See pg 21 of guidelines book.

SUGGESTED DISCUSSION TOPICS/QUESTIONS
(To be discussed during the tutorial with your tutor and peers)

1. What or who is Monsanto?
2. What is terminator technology? Why has it been introduced?
3. What is the 'polluter pays' principle? How does this apply to GMO's?
4. What are pesticidal potatoes? Do you think you would like to eat them? Give reasons for your answer.
5. Do you think GMO's are the answer to world food shortages? Justify your answer.
6. Do you know what the current legislation in SA is for on GMO's? Do you think it provides sufficient protection for consumers? Justify your answer.

Genetically modified organisms (htp://www.geneticallymodifiedfood/organisms index)

Scientists have the power to take a gene from one organism and put it into an entirely different species. It is already having a dramatic impact on the production of new drugs and researchers are now altering the crops that are used to make our most basic foods. It should make the products on supermarket shelves tastier and healthier. But there are those who fear genetically-modified organisms (GMOs) will only damage the environment and make us ill.

Genetic Engineering (htp://www.thecampaign.org/)

Genetic engineering is the process of artificially tampering with the genes of an organism. Through genetic engineering, scientists insert the gene of one organism into another in an effort to replicate characteristics in the receiving organism. So, for example, genetic engineers have added genes from the flounder (a fish) to tomatoes in an attempt to give tomatoes a longer shelf life. Genetic engineers also plan to use the technology to improve nutrition and even come up with medical benefits. But some biotechnology companies are also using genetic engineering to produce crops that can withstand increased amounts of pesticides, often pesticides sold by those very same companies.

Farmers have used **crossbreeding**—interbreeding between two varieties of the same or similar species—to improve crops and animals for thousands of years. **Genetic engineering**, though, offers a radical new twist on this theme. In crossbreeding, farmers don't stray far between species. Broccoli can be crossbred with cauliflower, for example, but not an eggplant. And certainly, no one would ever try to crossbreed a tomato with a fish. Through genetic engineering, these natural barriers have been blown away--with, some scientists say, unpredictable results.

READING 2: GM food: Head to head (htp://www.geneticallymodifiedfood/organisms index)

Controversy over genetically-modified (GM) food is reaching ever-greater heights.
We brought the two opposing sides of the GM argument together in a head-to-head confrontation. Dr Ian Taylor is the Scientific Political Adviser for **Greenpeace**, and Clive Rainbird is Biotechnology Communications Manager for manufacturers **AgrEvo**.

Do we need genetically-modified food?
Greenpeace: No - and in addition to not needing it, poll after poll shows that the public does not want it. There are two arguments put forward saying we do need it - one is that we need GM food to feed the people of the world - the other is that it is the way forward for British and European agriculture.
The fact is that there is sufficient food in the world to feed everyone. It is poverty and inequality which leads to people not getting enough.
The production of GM food is motivated by profit. As far as agriculture in the UK and Europe goes, all the supposed benefits of GM foods are completely speculative, yet we know that it is scientifically, quantifiably proven that organic agriculture is healthier.
AgrEvo: Yes. To maintain a thriving countryside, natural biodiversity must be increased while allowing farmers to produce our food and remain in business to prevent a collapse of country life.
One way of achieving this without paying higher prices required for organic production is, along with traditional plant breeding, the adoption of GM technology.
The key benefits from this new technology are food security - there is a need to double food supply by 2025 due to population increases, changes in diets and natural disasters brought about by climate change. Less arable land will be available and there will be a need to destroy more primary habitat unless technology meets the challenge.
And environmentally, we can make agriculture more sustainable by lowering pesticide use and by increasing efficiency through producing higher yields. We need to produce more food on less land and do so in a more sustainable manner.

What are the effects on human health of eating it?

Greenpeace: There is an enormous depth of scientific ignorance and uncertainty about what the immediate or long-term effects of placing GM foods into the food chain.

Time after time, the expert community has been proved to be wrong, and the public is fairly sceptical of its opinion.

Specific health concerns associated with GM foods have included the development of soya using a gene from Brazil nuts. The soya produced the allergic nut reaction. This was removed because developers knew to look for the allergy. But what about factors that are not even known, and not looked for?

Another aspect is antibiotic resistance. Some maizes were developed to contain antibacterial properties. If those were to be transferred to bacteria, they could become resistant to antibacterial drugs.

AgrEvo: No GM products are allowed into the food chain if there is any likelihood of harm to human health. All such products are, and have been, subjected to stringent regulation at both UK and pan-European levels. This mean that we can have even greater confidence in the safety of GM than non-GM food (non-GM foods are not subject to the same level of scrutiny).

Safety assessments of GM foods are quite different from those that were applied in the case of BSE, which has reduced the public's confidence in the regulatory process. With BSE, the assumption was that the public would not be exposed to the hazard.

With GM foods, it is assumed that the public will ultimately consume it and it is the consequences of exposure to them that are assessed so that these crops are only licensed if they are shown to be safe.

Is not the whole exercise just a money-making ploy, designed to make farmers reliant on particular providers of seed and pesticides?

Greenpeace: There is a scientific fascination in the analysis of this technology - it offers fascinating experimental potential. But, this is being promoted by organisations that exist to generate money - not to feed the earth.

Their development of things like terminator technology, where seeds produce plants which do not themselves produce seeds, is purely in the interests of financial gain.

They are trying to get a monopoly on food. I do not think that this is a healthy trajectory for agriculture in the UK, let alone the rest of the world.

AgrEvo: This technology has the potential to improve the efficiency of agriculture and to allow sustainable food production into the 21st Century.

Development of this technology requires major investment and the companies who decide to become involved will need to get a return on their investment.

Its goal, to improve currently available food, is the same as that of the traditional, long-established techniques of crop breeding.

The major difference is the ability to overcome the inefficiencies of traditional cross breeding and selection. We now have the ability to move precise genetic characteristics from one species to another. This will improve the quality of food produced and reduce the amount of chemicals used to protect these crops from weeds, pests and diseases. In practice, farmers will be no more reliant than they currently are on companies developing and selling new varieties.

Farmers will continue to have the choice to purchase non-GM varieties from a wide range of suppliers.

READING 3 - Allergic reactions and other possible health risks (http://www.thecampaign.org/)

1. Very few studies have been conducted to determine whether genetically engineered foods are harmful to human health.

Genetic engineering is a young, and in many ways poorly understood, technology. Many scientists believe that genetically engineered foods have been rushed much too quickly to market--to boost multinationals' profit margins--before adequate testing has been completed to ensure public health.

According to the **Washington Post**, the "dearth of studies is the legacy of a U.S. policy that considers gene-altered plants and food to be fundamentally the same as conventional ones, a policy some Americans are starting to question....

"And it is the legacy of broken promises by the Food and Drug Administration and the Environmental Protection Agency, both of which have said for the past five years that they intend to write rules to minimize the chances that gene-altered food will cause allergies or damage the environment."

2. Genetic engineering may trigger allergies in people.

Genetic engineering may involve the transfer of new and unidentified proteins from one food into another, with the potential of setting off allergic reactions. And allergies aren't simply a matter of slight discomfort; they can potentially result in life-threatening anaphylactic shock.

Without labelling, people with allergies won't know if they are eating foods that contain genes from other foods to which they are allergic.

In 1996, scientists were stunned to discover that soybeans engineered to include protein-rich genes from the Brazil nut also contained the allergenic properties of the Brazil nut. Animal studies had not revealed the allergenic nature of the mutated soybean. The manufacturer halted the release of the soybean just in time.

But with dozens of new genetically engineered crops under consideration, scientists believe much more extensive testing is required to ensure that those who suffer from allergies won't be affected by these foods.

Scientists also have discovered that Bacillus thuringiensis (Bt), a bacterium that has been spliced into millions of acres of corn, potatoes and cotton, may produce allergies in people.

Science News reported in July 1999 that a study of Ohio crop pickers and handlers shows that Bt "can provoke immunological changes indicative of a developing allergy. With long-term exposure, affected individuals may develop asthma or other serious allergic reactions."

3. Genetic engineering may create new toxins harmful to human health.

Scientists say genetic engineering may produce new toxins, with potentially devastating results for humans. In at least one case, disaster has already happened.

In 1989, a genetically engineered version of tryptophan, a dietary supplement, produced toxic contaminants. Before it was recalled by the Food and Drug Administration, the mutated tryptophan wreaked havoc. Thirty-seven Americans died, 1,500 were permanently disabled, and 5,000 became ill with a blood disorder, eosinophila myalgia syndrome.

4. Genetic engineering may lead to antibiotic resistance.

Genetic engineers use antibiotic "markers" in almost every genetically modified organism to indicate that the organism has been successfully engineered. Scientists believe these antibiotic markers may contribute to the decreasing effectiveness of antibiotics against diseases.

5. Genetic engineering may be linked with a resurgence of infectious diseases.

The journal **Microbial Ecology in Health and Disease** reported in 1998 that commercial gene technology may be behind a recent resurgence of drug- and antibiotic-resistant infectious diseases. We'll let Dr. Mae-Wan Ho, author of the report (and author of **Genetic Engineering: Dream or Nightmare?**), take over from here. She says:

"At the heart of the issue is horizontal gene transfer - the transfer of genes by vectors such as viruses and other infectious agents - which is exploited by genetic engineers to make transgenic organisms. While natural vectors respect species barriers, the barrage of artificial vectors made by genetic engineers are designed to cross species barriers, thus **greatly enhancing the potential for creating new viral and bacterial pathogens, and spreading drug and antibiotic resistance**. Totally unrelated pathogens are showing up with identical virulence and antibiotic resistance genes.

"Recent statistics are frightening. Infectious diseases were responsible for one-third of the 52 million deaths from all causes in 1995. Multi-drug resistant tuberculosis is now estimated to affect 10 million each year with 3 million deaths.

READING 4 - Monsanta: who we are (htp://www.monsanto)

Monsanto Company is a technology-based corporation involved in businesses that improve the quality of life. Founded in 1901, Monsanto is the world's foremost developer, producer and marketer of crop protection technologies and products. We currently do business in more than 130 countries.
Monsanto has come a long way in a century. That's probably because we have always believed that we are a company that offers more than just products and services. We offer a new way of thinking about agriculture. In the last 100 years, Monsanto Company has grown into a global company with a responsible position: To help feed the world.

Biotechnology: promise for a brighter future

By the year 2020, the global population is expected to increase by more than 40 percent, possibly surpassing the 8 billion mark. Feeding these additional billions, with a limited supply of suitable farmland, poses a dilemma of immense proportions. One answer may lie in agricultural biotechnology, which makes agricultural production more efficient.
As a world leader in plant and animal biotechnology research, Monsanto is finding new ways to protect crops, enhance yields and even improve the processing properties or flavor of foods.
The benefits of agricultural biotechnology are of particular importance to people living in developing nations. There, genetically improved seeds and other products will improve crop yields and quality and make farming possible in areas previously unsuitable for food production.
Among the current genetically improved, value-added products are:

- Insect-protected cotton with the Bollgard gene protects itself against cotton bollworms, pink bollworms and tobacco budworms. As a result, cotton growers can use significantly less chemical insecticides over their fields.
- NewLeaf insect-protected potatoes offer protection against the Colorado potato beetle, the most damaging insect pest in potato crops.
- YieldGard insect-protected corn protects itself against the European corn borer and related insect pests such as the Southwestern corn borer.
- Soybeans, cotton, corn, and canola with the Roundup Ready gene are genetically improved to tolerate Roundup herbicide. These technologies make it possible for growers to use Roundup in place of other herbicides that may be less effective or less desirable. Roundup herbicide can reduce the number of weed treatments and can also help reduce tillage to conserve soil moisture and reduce erosion of valuable topsoil.
- Posilac bovine somatotropin helps dairy cows produce milk more efficiently, without any loss in quality or natural wholesomeness.

READING 5 - Pesticidal potatoes (http://www.thecampaign.org/)

For years, many chemical companies made a lot of money by selling pesticides to spray on crops. These days, the game is changing: Genetic engineers have created potatoes that actually can produce **their own** pesticides. The New Leaf Superior, marketed by the Monsanto corporation since 1995, is engineered to produce the insecticide Bt, or Bacillus thuringiensis, in each one of its cells. Bt kills the Colorado potato beetle, one of the biggest threats to healthy potatoes. Unfortunately, the pesticidal potatoes are not labeled, so unless you consume only organic potatoes, there's no way to be sure that you're not eating the pesticidal variety. And some scientists say that the long-term effects of eating these potatoes is unknown.
In 1998, the **New York Times** reported that regulation of the pesticidal potato has fallen through the cracks of the U.S. government. The Food and Drug Administration told the **Times** it does not regulate the potato because it does not have the authority to regulate pesticides; that responsibility, said the FDA, lies with the Environmental Protection Agency. But the EPA said labeling pesticidal potatoes is FDA's job, because potatoes are a food. The FDA responded that the Food, Drug and Cosmetic Act forbids the food agency from including information about pesticides on foods. And so it goes.
Meanwhile, Phil Angell, Monsanto's director of corporate communications, told the **Times** that "Monsanto should not have to vouchsafe the safety of biotech food. Our interest is selling as much of it as possible. Assuring its safety is the FDA's job."

READING 6 - HOW GE IS AFFECTING SOUTH AFRICANS:

80% of processed foods in South Africa now contain the sorts of ingredients that may have been genetically engineered (GE) - but aren't safety tested or labelled. World scientists are calling for an immediate withdrawal of all genetically engineered (GE) foods, farming and patenting. (See www.psrast.org/defknfood.htm)

Since 1988, the South African Dept of Agriculture has allowed our dairy cows to be injected with rBst, a genetically engineered milk-increasing hormone banned in several countries around the world for its human and animal health risks. Alarmingly milk from these cows is not labelled as such in South Africa.

Despite environmental problems overseas with GE crops, South Africa currently grows tens of thousands of hectares of commercial GE crops and field trials with no law able to stop them cross-pollinating with indigenous or agricultural plants. Results are unpredictable and irreversible. And the companies developing and marketing the technology have no legal responsibility to pay for any damage caused. In fact, our GMO (Genetically Modified Organisms) Act ignores the 'polluter pays' principle set out in the National Environmental Management Act - and instead makes everyone from the farmer to the consumer liable for any damages caused. Neither do we have segregation or labelling of imported or exported GE food ingredients or animal feed....

SAFeAGE (South African Freeze Alliance on Genetic Engineering) considers five years the minimum time needed to carry out appropriately stringent safety tests on GE foods and thorough research into the health, safety & environmental impact of growing them. It is also the minimum time needed to set up genuinely open transparent processes for citizens to be involved in decision-making on foods we are all eating. Genetic engineering and patenting of living things raises complex social and ethical issues we need time to discuss and fully consider as unlike chemical spills or faulty electrical appliances, genetic mistakes cannot be cleaned up or recalled but multiply, migrate and mutate to be passed on to future generations.

At the end of the Five Year Freeze we will be in a better position to decide whether or not to proceed with using this new technology in our food, farming and healthcare - and if we do, what sort of safeguards need to be put in place.

SAFeAGE is a coalition of individuals and groups in agreement with the sensible precautionary approach outlined above - and welcomes letters supporting these aims from individuals and groups . These letters are being compiled for presentation with our call to government. For details, and/or a copy of the Freeze Manifesto, call SAFeAGE co-ordinator Karen Kallmann, on 021 761 0549 email   safeage@mweb.co.za or fax (021) 762 2238

APPENDIX 8

Evaluation sheet (second iteration)

ENVIRONMENTAL PROBLEMS 1 - 2001

EVALUATION OF THE SELF-ASSESSMENT PROCEDURE

1. What did you like **best** about the self-assessment exercise?

2. What did you like **least** about the self-assessment exercise?

3. Were there any criteria particularly difficult to rate yourself on? If "yes", please state which.

4. Did the marking criteria cover all aspects of the essay? If "no", please list criteria you feel should have been included.

Please answer all questions by ticking the appropriate category: agree, neutral or disagree

	Agree	neutral	disagree
1. I expected the kinds of questions asked in the test			
2. The questions were too difficult for a first year course			
3. The individual criteria helped me mark the essay question			
4. The model answer helped me mark the essay question			
I found the self-assessment exercise:	x	x	x
5. easy			
6. enjoyable			
7. time consuming			
Having done the self-assessment exercise, I feel:	x	x	x
8. I learned some subject content			
9. I learned about essay writing			
10. I will write in a more structured way in future			
11. more confident about writing essays			
12. more confident about working independently in general			
13. more motivated about my work			
14. I will be more critical in my learning			
14. I will learn differently for my next test			
15. We should do more marking ourselves			
16. If we do more marking ourselves, the marks should count			

Please turn over

Any comments you wish to make?

_____

_____

_____

_____

_____

_____

_____

_____

Biographical data (This information is for research purposes)

Gender: Male   Female

Home language: ....

Age: ....

It would help me in my research if you provided your student number. All information will be kept **completely** anonymous. However, if you not wish to provide your student number, it is also fine.

Student number:

APPENDIX 9:

Evaluation responses to question on what students liked *best* about the self-assessment process (second iteration)

Evaluation responses to question on what students liked *best* about the self-assessment process.

Learning from mistakes or the process (in a general way)
- I've seen my own mistakes
- Now I know what is expected of me and what to improve on
- One is able to see and evaluate her own mistakes
- Find out where I went wrong so I can improve
- I found out my weak points and how to rectify them
- Ability to compare with "real answer" – see how others think
- Could see where we went wrong
- It enlightened you about the errors you make
- Could see what answer should have been like and compare with actual answer given
- It gives you an awareness when writing an essay on what is required
- Gave me a view about what is actually look for when marking an essay
- I learnt what a good essay should consist of
- Made me be objective about my work

Improved essay writing skills
- Helps to improve our writing skills for future tests
- It helps me to understand how essay is marked and in future how I can write
- Gave me a chance to see first hand how questions are marked. I'll be able to answer essay's much more effectively

Recognition of difficulty of process of assessment
- I learned how difficult it is to mark your own test and someone else's test
- It gave me an idea of what it is like to mark my test

Use of criteria
- Looking at the criteria markers use, so I can remember them for next time when I write an essay
- Using criteria to mark the essay

Being critical
- helped me be more critical of myself, which I normally found difficult to be able to do
- Marking other people's work is a good thing because it is good to be critical

Other
- It was like being a lecturer marking a students essay
- Interesting, informative
- I laughed at my writing
- I got to think more of managing time allocation in each answer

APPENDIX 10:

Evaluation responses to question on what students liked *least* about the self-assessment process (second iteration)

Evaluation responses to question on what students liked *least* about the self-assessment process.

Dislike or difficulty of being critical of own work
- forced me to be critical of myself
- it is hard to judge your own work
- hard to be objective of myself, which is not easy
- marking and critising my own work – I have self esteem problems
- commenting on my marks – because I understand why I wrote what I wrote. so I think it is all relevant and logical!
- Judging what is relevant and not relevant information because you like to think much of what you say is relevant
- Its not fun having to be critical about yourself and the mistakes you made
- Marking my own work
- Couldn't be critical of my own work. I either slash myself or boast
- You had to be too critical
- Hard to judge relevant/irrelevant info
- It felt like all the relevant information was given but then at the same time it did not coincide with the model

Allocation of marks
- It is not easy to giver the mark because the other markers might find them meaningless
- Having to give myself marks
- You have to assess with care and it is much difficult to mark for yourself because you might be tempted to give yourself more marks than what you have to get
- Having to assign a mark. as I felt I did well. but am embarrassed to say so

Bias related to marking own work
- marking my own essay (bias)
- Being unbiased

Time and effort
- Time consuming (many)
- It was tedious
- A lot of reading
- Long. much thought involved
- It is brain wrecking
- Boring and monotonous

Other
- It sometimes remind you with your bad work
- Being wrong when you thought you were right
- Nothing – very relevant
- It was a little boring to go over your own work and point out your own mistakes
- I did not like to see where I went wrong. makes me feel bad
- The stupid questions like "did you enjoy it?"
- It took a lot to keep track of all the info needed/gained from the model answer
- I don't like anything about it

APPENDIX 11:

Open-ended comments provided by students in evaluation of the self-assessment exercise (first iteration)

Open-ended comments provided by students in evaluation of the self-assessment exercise - first iteration

Positive comments

1. The criteria which we marked by, for example "Does each paragraph have a single main idea?" showed me what I should include, exclude or what the structure of the essay should look like.
2. I appreciated the opportunity to go back and reflect on what I still need to learn, both in style and content of my writing.
3. I learned more about essay writing by marking my own essay. Reading another person's essay also helped because together with the model answer I could see what was left out – and better planning at the beginning of the essay would have helped. Reading the question, answering and keeping to the relevant answers is what should be done in writing the essay. Also learned that properly labelled diagrams would have helped.
4. Marking my own work makes me learn for the test all over again. If you get a marked test back you only worry about the mark you get and do not look at the work you learned for the test again. Marking tests yourself is very good revision.
5. The assessment procedure has made me more aware about the criteria of marking.
6. I found out that the structure is just as important as content. I now know where I lose my marks.
7. This has been a very "strange" yet enlightening exercise, to know the hardships the examiners go through when marking scripts
8. This was a very useful exercise, as it gave me insight into our own weaknesses and problems with our study material. It was difficult however to be objective about my own test but now I appreciate how difficult it really is to marks tests and I now know what to look out for in the future.
9. With the criteria I will be able to scrutinise my work better.
10. The way we marked the essay with the model answer was good. It gives a clear picture of how we have to structure our essay and to answer the short questions.
11. It was a good exercise.
12. Its enabled me to see what is being looked for in my writing when I answer test and exam questions.
13. Now that I have completed this exercise, I will "most definitely" learn differently for my next test i.e. to structure and order my work/essay better in order to be more effective. I think that this exercise will help many learners and make them realise where they went wrong – especially when they see their marks!
14. This was a good exercise as it made us realise our own mistakes, and helped us to see how our essays will be marked, and how our information should be set out to become more easily markable.
15. An extremely good exercise for students interested in their course. If a student knows something about marking, it will make life so much easier while writing essays. Though, all the material should still be learnt.
16. I felt that it was a valuable exercise in self-analysis. The things I leaned will make me write essays from a more critical standpoint – and thus write better essays, more relevant and to the point.
17. Model answers are a good guide for marking.
18. I realise how difficult it is to mark essays and tests. I think that now I'm going to learn harder, make more sense, structure everything properly so that the person marking does not need to bang his/her head against the wall (after marking my test) wishing it was mine (head).
19. I think this exercise was good for us – helped us to see were exactly we went wrong and how coherent we actually were during our essay writing. Learn from your mistakes would apply here!

20. Marking my own work helped me realise the kind of level that I should be writing an essay.
21. I enjoyed the test and felt the answers that could have been given were pretty obvious if one knew the content studied throughout the course one could of at least managed to pass the test.
22. Interesting idea, definitely helped in where I went wrong and how I can improve.
23. No major comments except to mention that own test marking with model answers provided is helpful. It helps you to learn from your mistakes.
24. A learning experience to mark my own work because now I know where my weaknesses are and also the mistakes. Now when I write essays I would be able to approach them with confidence.
25. This is very useful because you see what mistakes you made and wrote and you have to adjust it for yourself.
26. The self assessment helps see exactly what is expected from the question and the way in which it needs to be written.
27. Having a list of criteria makes you conscious whether or not you are meeting them in your piece of writing. It allows for a more structured approach to the essay.
28. The test made us focus on the main idea instead of irrelevant information. We will now concentrate on examples and diagrams in our answers. We should do this more often.
29. I find it difficult to evaluate myself. This exercise helped me break the ice. And perhaps I will be more confident in my next interview.
30. This exercise does help as one now knows what to expect from markers. how to mark better and as a result how to write better essays or paragraphs.
31. I feel this is an effective and useful exercise as it allows us to understand how our tests are actually marked. It also gives us a better idea of how to write an essay and what information can be included or excluded.
32. All round I feel marking our own essays is helpful to our understanding of the course. It shows us what the marker looks for in an essay and what should be included for easier reading for the marker.
33. I believe this exercise is important and useful and should be done in most first year courses.
34. This system helps one to find one's shortcomings and improve on them.
35. Marking of one's own test helps one to understand essay writing better and it also shows one where he or she went wrong in the essay.

Neutral (or positive and negative issues raised)

36. For the next test I have learned to begin answering the most heavily weighted answer. I spent way too much time on the first and then it became obvious I had minutes to work on the second. That was one of my major problems for this test.
37. I like analysing my own work. I will know that in the future, I must think about who is reading my essay. It's unfortunate this wasn't made clear to me before the test. I also thought there were some weaknesses with last year's model answers.
38. The idea of marking ones own test is a good idea. but perhaps it should be part of a tut, not part of a test. I think its unfair in terms of marks, considering it counts for 20% of our test mark.
39. I simply feel that there is no such thing as an exact model answer and every point written by the student should be considered and analysed in respect of its relevance, according to the context in which it was written. Overall, I feel that personal evaluation and assessment is beneficial to a persons growth.
40. It was different!
41. I agree that this kind of marking own test is a way to learn some few things more. But, I think it takes too much study time away. I'm picturing doing this for all my courses! There is no way of managing this. ·

42. I personally think that marking our own essays aren't a good idea (if they count) because sometimes a person could be more objective or too casual with their work. At the same time is is also a good exercise as it makes us aware of what the examiners looked for.
43. I am not sure that marking our own papers are such a good idea. But this probably was a very useful exercise.

Negative comments

44. I have not learned anything from the exercise. unless I use the model answer as what you want for the next exam. I have done assessment procedures like this before.
45. When you have to mark your own work there is always a feeling of unsureness over whether you are being strict or too lenient and whether you are looking for the right thing or not.
46. The test questions are not explicitly clear as to what they want. Maybe the important words DISCUSS and DESCRIBE could be highlighted.
47. Hard to mark own work – tried to be harder and less lenient. At times the model answer was difficult to refer to.
48. It is hard to allocate time to the essay writing especially when there is limited time to write the essay.
49. More time to write our essay. Please, no more tests in the first period!!!
50. I don't like marking because it is very hard to know exactly what a person deserves and it's difficult to be critical of your own work.
51. As the marking of the essay will improve our essay writing skills as we now know what is required, I don'' feel that it should be given a mark as it bears absolutely no relevance to the course for which we have signed up. If we were doing a course in teaching perhaps then yes by all means take in the marks. This is a course in Environmental Geography and the exercise should not be done for marks.
52. The type of question caught me by complete surprise because I felt that the question was quite vague for such high marks.
53. Objective marking may be helpful to some people but I don't feel that essays should be written in such a formulaic method.
54. In future it would help for essays to be written on lined paper.
55. With marking your own test, one is sometimes unable to see when they are wrong, as they try to find a way to reason and wrong (if there is any).

APPENDIX 12:

Open-ended comments provided by students in evaluation of the self-assessment exercise (second iteration)

(F = female, M = male, E = english-speaking,
N = english second language)

Open-ended comments provided by students in evaluation of the self-assessment exercise – second iteration. (F = female, M = male, E = English-speaking, N = English second language)

Positive comments

1. Very happy with the self assessment exercise – it helped me cos I'm not totally confident with essay writing (M, E)
2. The self-assessment is helpful in that it helped me view the material in a different light (F, E)
3. The self-assessment was good because it helped me look at my work differently, the views I had before and after changed. I saw things differently from before this exercise, which has now changed (F, E)
4. This model (self assessment) is quite a very good thing because in future, students will not complain about they essay marks. They will know that the marks they got is the marks they deserve. Students will also know what is needed from the introduction of the essay, body and conclusion. Thereafter he/she can write a very good essay (M, N)
5. The self assessment is good in a sense that you insight into your potential (M, E)
6. The exercise helped me especially realise how important it is to plan an essay well and how important proper time allocation is in a test. This does make a difference in the end especially when one realises that too much emphasis and time consumed in planning for a longer essay despite the higher marks involved, in the end impact negatively on the other question and overall test (F, N)
7. Generally very informative and helpful (M, E)
8. Difficult to self assess but worthwhile in the end. Made me realise the errors in my writing. Showed me what is expected of me from the examiner (F, E)
9. Interesting and informative. More respect for markers as it is quite a difficult task to try and be fair, especially when marking my own essay (F, E)
10. Interesting concept (F, E)
11. I have learnt a lot from this exercise and I'm sure that there'll be a great improvement in my next test since I now know what markers look for when allocating marks for essays (F, N)
12. I think this was a valid exercise and worth continuing in the future. It is beneficial to all if done properly (M, E)
13. This exercise should be included in pracs next year as it really helps to gain a different perspective on topics for essays. I have found that there is much more to an essay that having the right answer or wrong answer. It is all about using examples and having a logical explanation for your point of view. Thanks for the exercise! (F, E)
14. Very good exercise, can learn a lot (M, E)
15. It is enjoyable to mark yourself because the answers provided guide you to compare your answers and see your mistakes (F, N)

Neutral comments

16. I feel I did learn from the experience but I am not sure if I would like to do it again (F, E)
17. Ultimately I have mixed emotions about the assessment, on one hand I was pleased to see the correct aspects of my work and on the other hand I feel disappointed that during the test I wrote things that made sense at the time, but now seem inappropriate. I feel that I have learnt something important today that will help me in essay writing (F, E)
18. Not all essays are going to be speeches. Some are going to be reports. Therefore there should be some emphasis on different styles of essays as well as content material. All in all, I think the self-assessment is a brilliant idea (M, E)

19. Marking is influenced by the persons current emotional state (tiredness vs alertness). This can lead to marks being scued (sic) intentionally (M, E)

Negative comments

20. It is hard to mark your own work because the time you mark you are wasting time because you are just guessing how much can you give yourself. I think to mark your work as a student is a waste of time. Some student give them higher marks, but the lecturer give them lower marks (F, N)
21. Question 1 was no clear. What was expected was not clear to the students. (F, N)
22. To mark your own test is difficult. The lecturers should understand in an exam that we do not have much time to make the essay fancy, some of the ideas you remember them late then try to make them fit in, it then destroy the essay. It is better to be strict on other essays not exam essay. (F, N)
23. I would like to ask for lined paper in the exam. It leads to a more organised essay (M, E)
24. Maybe a little more time should have been allocated for the essay writing (say 10 minutes) after all are we not being tested on content and not speed of writing? (It does take time to plan an essay) (M, E)
25. Marking is a difficult topic to discuss about and it must be done by an individual who is very competent and understands the work or topic the essay question is about like a professor in the relevant subject. (M, E)
26. Paragraph question could have been more clearly asked. Just for safety's sake it could have stated that a paragraph was expected (F, E)
27. Should have given us more time for the test, an in future allocate more time for long tests (M, E)
28. It is hard to comment or to give suggestion about your own writing (M, E)
29. Self-assessment is sometimes making me to be afraid because if I wrote the work that know it is not well written I don't want to see it again, until it is marked (F, N)
30. Such an exercise should not be for marks because it is still difficult at our standard to write effectively and with technique. We should be given time to practice such techniques, and even provide classes if possible (F, N)
31. Looking at own test was the most helping way to see how difficult it is to give a student marks which are low. But it is very disappointing to write an essay which is time consuming and at the end you get very low marks not even 25% but round about 12%. Sometimes you feel like dropping the course. I will be very happy if I could get the amount of marks approximately nearer to these I have written on my script i.e 56%. Please!! (F, N) (Note: the student got 43%)
32. It would be more acceptable if the marks we gave ourselves will be considered. Because we were honest and gave our insight. I will be very disappointed to get less mark. There is not enough time in a test to structure an essay (F, N) (Note, student gave themselves 65% and they got 53%)