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The use of Competence Based Education and Training (CBET), Interactive Teaching Methods, Learning-by-Doing and Student Focused Teaching at Agricultural Colleges in South Africa.

A research project submitted to Van Hall Larenstein University of Professional Education in partial fulfillment of the requirements for the Degree of Master of Development, specialization Training, Rural Extension and Transformation

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Dedication

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“Ek is baie lief vir julle elkeen en julle moet weet dat ek vir altyd sal dankbaar wees”.

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List of Abbreviations

AET	:	Agricultural Education and Training
AgriSA	:	Agriculture South Africa
ATI	:	Approach to Teaching Inventory
CBET	:	Competence Based Education and Training
CBL	:	Competence Based Learning
CCA	:	Cedara College of Agriculture
CCSF	:	Conceptual Change and Student Focused
CEQ	:	Course Evaluation Questionnaire
DACET	:	Department of Agriculture, Conservation, Environment and Tourism
ELT	:	Experiential Learning Theory
IAC	:	International Agricultural Center of Wageningen University
ICATE	:	Improving the Capacity of Agricultural Training and Education
ITTF	:	Information Transmission and Teacher Focused
KZN	:	KwaZulu-Natal
LRAD	:	Land Redistribution for Agricultural Development
NAFU	:	National African Farmers Union
NPT	:	The Netherlands Programme for the Institutional Strengthening of Post-secondary Education and Training Capacity
PCA	:	Potchefstroom College of Agriculture
PCT+	:	Agricultural training organisation based in The Netherlands
PPP	:	Power Point Presentation
SAQA	:	South African Qualifications Authority
SEEQ	:	Student Evaluation of Educational Quality
SENCO	:	Special Educational Needs Coordinator
SETA	:	Sectoral Education and Training Authorities
ToT	:	Training of Trainers
VHL	:	Van Hall Larenstein

Abstract

This study investigates the experience of trainers and students from Potchefstroom College of Agriculture and Cedara College of Agriculture with regards to Competence Based Education and Training (CBET), Interactive Teaching Methods, Learning-by-doing and student focused teaching.

The Agricultural Education and Training (AET) and Rural Development policies of the National Government prescribe certain guidelines to follow. Educational and training organisations have to adapt to a constantly changing agricultural environment in South Africa. A consortium of organisations were involved in a project to improve the capacity of Education and Training at Agricultural Colleges in South Africa. Competence Based Education and Training (CBET), Interactive Teaching Methods, Learning-by-doing and student focused teaching were identified by this consortium in cooperation with the National Departments of Agriculture and Education.

These considerations are followed by a thorough interrogation of literature that reveals a variety of concepts and interpretations of the design of learning programmes (curriculum design), teaching methods, approaches to teaching, application of learning styles, methods to evaluate student satisfaction and finally conclusions from literature. It firmly links the problem to previous research and provides a sound rationale for the conduct of the study.

The enquiry opens by evaluating the student perceptions of educational quality by using the standardised SEEQ questionnaire. Trainers approach to teaching were measured by using the ATI questionnaire. Interviews were held with twelve trainers and eight groups of students (5-10 students per group).

Having examined the principle dynamics that influence student learning in the Agricultural Colleges environment the study concludes with certain recommendations about the way forward with regard to the application of Competence Based Education and Training (CBET), Interactive Teaching Methods, Learning-by-doing and student focused teaching.

Chapter 1

Introduction

The agricultural colleges in South Africa have a longstanding relationship with the farming community. There are currently eleven colleges of agriculture distributed throughout South Africa.

The Cedara College of Agriculture(CCA) is located just outside Pietermaritzburg in the Province of KwaZulu-Natal(KZN) bordering the grassland, savanna and subtropical thicket biomes. http://www.plantzafrica.com/frames/vegfram.htm

Both of these colleges currently offer a Higher Certificate in Agriculture (two years full-time residential course), and a Diploma in Agriculture (one year additional). A Senior Certificate or equivalent is the minimum requirement for admission to the Higher Certificate in Agriculture. There are minor differences in the courses provided by these colleges that relate to agricultural production in the specific areas where they are located and also with regard to specialisations offered to students. All qualifications are accredited nationally. These qualifications lead to employment as commercial farmers or various technical positions in the agriculture related industry.

A note on the terminology as used to refer to trainers at the agricultural colleges:

Trainers: Used in this thesis to refer to both the lecturers and instructors at the various agricultural colleges.

Lecturers: Officials employed by the Provincial Departments of Agriculture as agricultural scientists and responsible for presenting the theoretical and practical courses as offered by the agricultural colleges.

Instructors: Officials employed by the Provincial Departments of Agriculture as agricultural technicians and responsible for presenting some theoretical but predominantly practical courses as offered by the agricultural colleges.

The teaching methods employed were traditionally conservative, structured and highly disciplined, and have stayed the same, or changed only slightly during the past. Teaching is characterised by one person, the trainer, standing in front of a class of students. This trainer knows something and tries to teach the student what he knows.

This means that teaching focused mainly on the transfer of information in a formal lecture set-up and that practicals were based on applying the theory learned in class. This agrees with the ITTF (Information Transfer/Teacher Focused) category as defined by Trigwell et al, 2005.

A concerted effort has been made since 2005 to improve the capacity of agricultural training and education at agricultural colleges in South Africa (ICATE project). This included the training of trainers (ToT) in modern teaching methods in an effort to adapt to the changing educational environment (replace with newer reference).

Competence Based Learning (CBL) was identified at the outset as the preferred learning model by the ICATE project. The following agricultural colleges were identified to take part in the ICATE project: Cedara college in KwaZulu-Natal province, Lowveld college in Mpumalanga province, Madzivhandila college in the Limpopo province and Potchefstroom college in the NorthWest province.

Experience in South Africa shows that a lack of practical skills and knowledge, both at emergent farmers and at extension workers level, is one of the major stumble blocks in

achieving sustainable results in enhancing the new emergent farming sector. Hence, without compromising academic standards, the ICATE project proposed to reinforce where the four Colleges are strong: practical oriented training. All partners, especially PTC+ and to a lesser extent Van Hall Larenstein (VHL) and the International Agricultural Center of Wageningen University (IAC) have extensive experience in enhancing practical training following the principles competence based education, experiential learning and learning by doing. In this respect, the upgrading of practical facilities and college facilities was essential.

On the other hand, as “lead institutes in agricultural extension with a specialised knowledge base” the Agricultural Colleges had acknowledged a need to become more competent in responding to changing circumstances, e.g. to the requirements of new entrants in the farmers community (emerging farmers), the elaboration of policies for extension development and special target group oriented extension delivery.

An adequate and practice oriented educational strategy towards responsiveness is Competence Based Education and Training (CBET) was identified and proposed by VHL and IAC.

CBET logically entails considering the demand from employers (changing labour market) in the development and revision of existing and new curricula and courses of Higher Education and Further Education and Training and thus the consultation of key-stakeholders. Taking the existing specialized knowledge base of the Agricultural Colleges in cooperation with partners (or partners to be like the University of Pretoria), as a starting point, Competence Based Education and Training can be presented as follows:

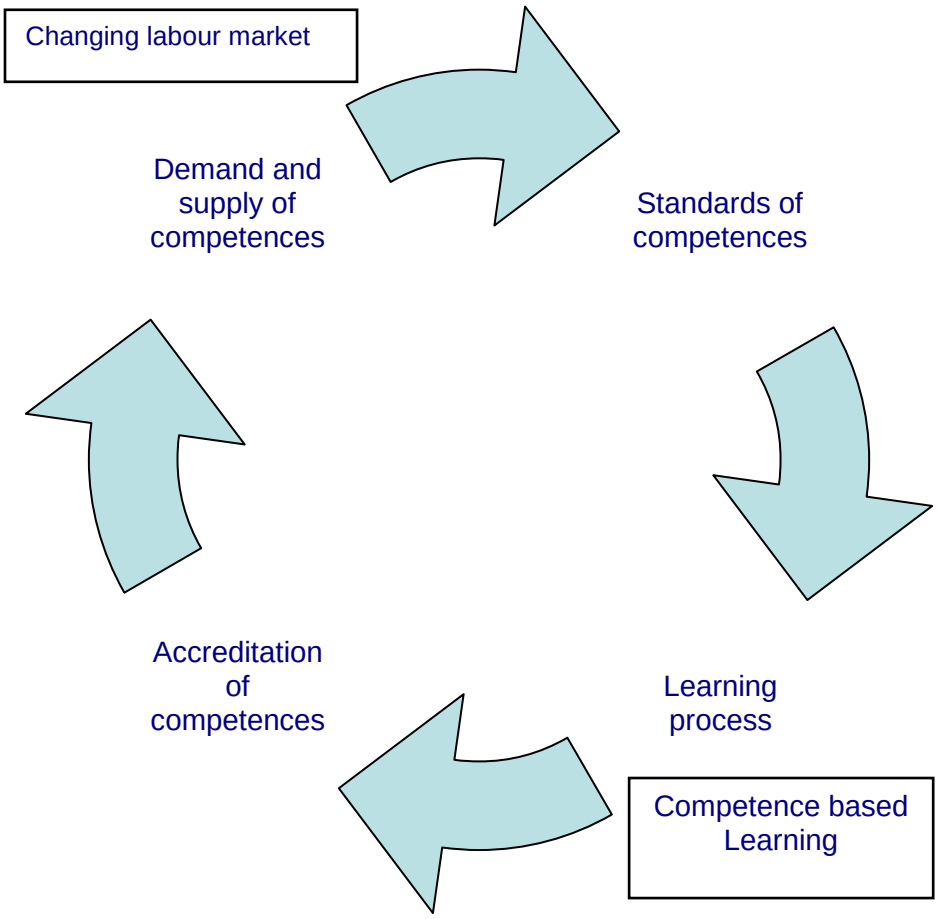

Figure 1.1 Competence Based Education and Training in the South African situation. (source: NPT project document)

To enhance the responsiveness of the curricula, field practice programmes and other practical learning activities, play a crucial role and entrepreneurship is explicitly addressed.

In general, when an educational organisation adopts the CBET system using experiential learning, they will need to adapt its guidance and evaluation system for the field practice at least. Most effective is to have one integrated system of training, guidance and evaluation for both the field practice and the other components of a curriculum. That is achieved nowadays, as a part of CBET, by portfolio and assessment methodologies and the corresponding experiential learning and guidance contracts between the organisation and the employers.

In the current changing professional setting of agricultural extension (communication for rural innovation) delivery services, communication, facilitation, teaching, negotiation and needs assessment skills as well as the ability to set priorities are central competencies qualified staff has to avail of, at all levels. Not only '*know about skills'* but also *'know-how skills'* are required to become more responsive to changing circumstances. In a 'training for trainers' approach a cascade effect is pursued: senior trainers acquire the above skills in such a way that they become competent in applying the same approach to their clientele (extension workers, agricultural trainers, etc.) who in turn will be able to use it for their audience (emergent farmers, farm workers, and others).

In respect of the above-mentioned setting, a key component of modern teaching is so-called E-Learning. E-Learning is a powerful instrument for both formal and informal education. The ICATE Consortium took E-Learning from a constructivist perspective, implying a move from the classical "chalk and talk culture" paradigm, but never as a substitute for classical methods and face-to-face learning. Collaborative opportunities were to be offered to give a sense of ownership to the students, front-line extension workers included, allowing them the acquisition of competencies that they could employ in actual settings. In addition, E-Learning tools could be deployed to enhance the networking capabilities of the various target groups and to build a resource database for front-line extension workers and others. Extension staff at different levels and the college's trainers formed the target audience. A proposed policy document on the role of Information and Communication Technology in general and that of E-Learning in particular, were to have been developed for the establishment of a sustainable, responsive and effective extension system.

Most of the trainers employed at agricultural colleges have formal teaching qualifications and have also attended a ToT course in The Netherlands at PTC+. A lot of emphasis was placed on CBL, learning-by-doing and student centred teaching.

Although all the trainers have been trained in interactive, competence based learning, learning-by-doing and student centred teaching methods none of the agricultural colleges have up to now changed their curriculum completely to CBL. From communications with several of the trainers it is clear that they have however incorporated some of the teaching methods (interactive and student centred) in their courses. Because there is no complete implementation of CBL at any of the colleges, the trainers are confused about how, what they have learned, should be applied in their day-to-day lessons. The following questions are now apparent: Which methods have been applied? And, why have certain methods been chosen by trainers while others have not? What are the trainers experience with these methods? What results are obtained by using these methods? Which methods are the most effective and/or successful? How do students experience the changes in teaching methods?

And finally: Can the colleges maintain the current “in limbo” situation without applying all of the CBL principles, and, which of the teaching methods can be incorporated successfully into the current non-CBL curriculum?

Chapter 2

Literature Review

"changes in teaching will lead to changes in the quality of student learning" Bowden, 1988

Approach to Teaching and Learning

Qualitatively different approaches to learning, "surface" and "deep", were identified by Marton et al, 1997. When students adopt a deep approach to learning they intend to engage with what is being learnt in a way that leads to a personal and meaningful understanding. This approach may appear to differ when adopted in different disciplines, but at the core of all deep approaches is an intention by the student to understand ideas and seek meanings. The same student, perceiving a different context, may adopt a surface approach, where tasks are seen as being externally imposed. Their intention is to meet these requirements, particularly as they relate to assessment systems, as described more fully elsewhere (Prosser & Trigwell, 1999).

From studies by Prosser et al, 1994, and Trigwell et al, 1994, five qualitatively different approaches to teaching were described. These five different approaches to teaching range from a *conceptual change/student focused* (CCSF) approach to an *information transmission/teacher focused* (ITTF) approach. In adopting a CCSF approach, which is inclusive of aspects of the other four, teachers have a student-focused strategy with the aim of changing students ways of thinking about subject matter. They focus their attention on the students and monitor their perceptions, activity and understanding. Transmission is seen to be necessary, but rarely sufficient. They assume students construct their own knowledge, so the task of the trainer is also to challenge current ideas through questions, problems, discussion and presentation. This approach includes a mastery of teaching methods, including those associated with transmission.

In other contexts teachers work with a view where the focus is on what they do as teachers, or on the detail, individual concepts in the syllabus or textbook, or the teachers own knowledge structure, without acknowledgement of the students own knowledge or experience. They see their role as mainly transmitting information based upon that knowledge to their students. In adopting this *information transmission/teacher focused* (ITTF) approach to teaching, forward planning, good management skills, use of an armoury of teaching competencies and the ability to use information technology (IT) are seen as important.

Transmission elements of the ITTF approach are included in the CCSF approach, but the student-focused element of the CCSF approach is not a part of the ITTF approach. Because of this inclusivity, a CCSF approach is considered to be a more sophisticated approach than the more limiting ITTF approach.

Problem Based and Project Based Learning

Problem based learning comes from a view that all knowledge is constructed and reshaped through social, political and cultural influences (Education Queensland, 2002). Too often, what is taught in teacher education is not presented as problem based and with links to the real world. Students tend to expect, and often receive, "correct" solutions to specific situations (Sorin & Klein, 2002). However, keeping in line with authentic, real world situations, problems should be purposely ill-defined, not easy to solved and open to multiple interpretations (Herrington, Oliver & Reeves, 2003). Some details could be written into a case scenario or even presented through various methods like role-play, video, guest speakers and surveys that offer a glimpse into the real situation. The rest

has to be left to the learner to explore and only supported by the facilitator when urgently needed. Organising learning around loosely structured problems encourages learners to work through them, drawing upon and developing skills and knowledge related to a number of disciplines (Borich, 2007).

To understand the reasoning behind the emphasis on teaching methods it is also necessary to look further into the process of learning. This is also where learning-by-doing, also known as experiential learning, is important. David Kolb's learning styles model and experiential learning theory (ELT) is described.

Having developed the model over many years prior, David Kolb published his learning styles model in 1984. The model gave rise to related terms such as Kolb's experiential learning theory (ELT), and Kolb's learning styles inventory (LSI). In his publications - notably his 1984 book 'Experiential Learning: Experience As The Source Of Learning And Development' Kolb acknowledges the early work on experiential learning by others in the 1900's, including Rogers, Jung, and Piaget. In turn, Kolb's learning styles model and experiential learning theory are today acknowledged by academics, teachers, managers and trainers as truly seminal works; fundamental concepts towards our understanding and explaining human learning behaviour, and towards helping others to learn. See also Gardner's Multiple Intelligences and Visual Auditory Kinesthetic (VAK) learning styles models, which assist in understanding and using Kolb's learning styles concepts.

In addition to personal business interests (Kolb is founder and chairman of Experience Based Learning Systems), David Kolb is still at the time of writing Professor of Organizational Development at Case Western Reserve University, Cleveland, Ohio, where he teaches and researches in the fields of learning and development, adult development, experiential learning, learning style, and notably 'learning focused institutional development in higher education'.

Kolb's Experiential Learning Theory (learning styles) Model

Kolb's learning theory sets out four distinct learning styles (or preferences), which are based on a four-stage learning cycle (which might also be interpreted as a 'training cycle'). In this respect Kolb's model is particularly elegant, since it offers both a way to understand individual people's different learning styles, and also an explanation of a cycle of experiential learning that applies to us all.

Kolb includes this cycle of learning as a central principle of his experiential learning theory, typically expressed as a four-stage cycle of learning, in which “immediate or concrete experiences” provide a basis for observations and reflections. These observations and reflections are assimilated and distilled into abstract concepts producing new implications for action which can be actively tested in turn creating new experiences.

Kolb says that ideally (and by inference not always) this process represents a learning cycle or spiral where the learner “touches all the bases”, i.e., a cycle of experiencing, reflecting, thinking, and acting. Immediate or concrete experiences lead to observations and reflections. These reflections are then assimilated (absorbed and translated) into abstract concepts with implications for action, which the person can actively test and experiment with, which in turn enable the creation of new experiences.

Kolb's model therefore works on two levels - a four-stage cycle:

- Concrete Experience - (CE)
- Reflective Observation - (RO)
- Abstract Conceptualization - (AC)
- Active Experimentation - (AE)

and a four-type definition of learning styles, (each representing the combination of two preferred styles, rather like a two-by-two matrix of the four-stage cycle styles, as illustrated below), for which Kolb used the terms:

- Diverging (CE/RO)
- Assimilating (AC/RO)
- Converging (AC/AE)
- Accommodating (CE/AE)

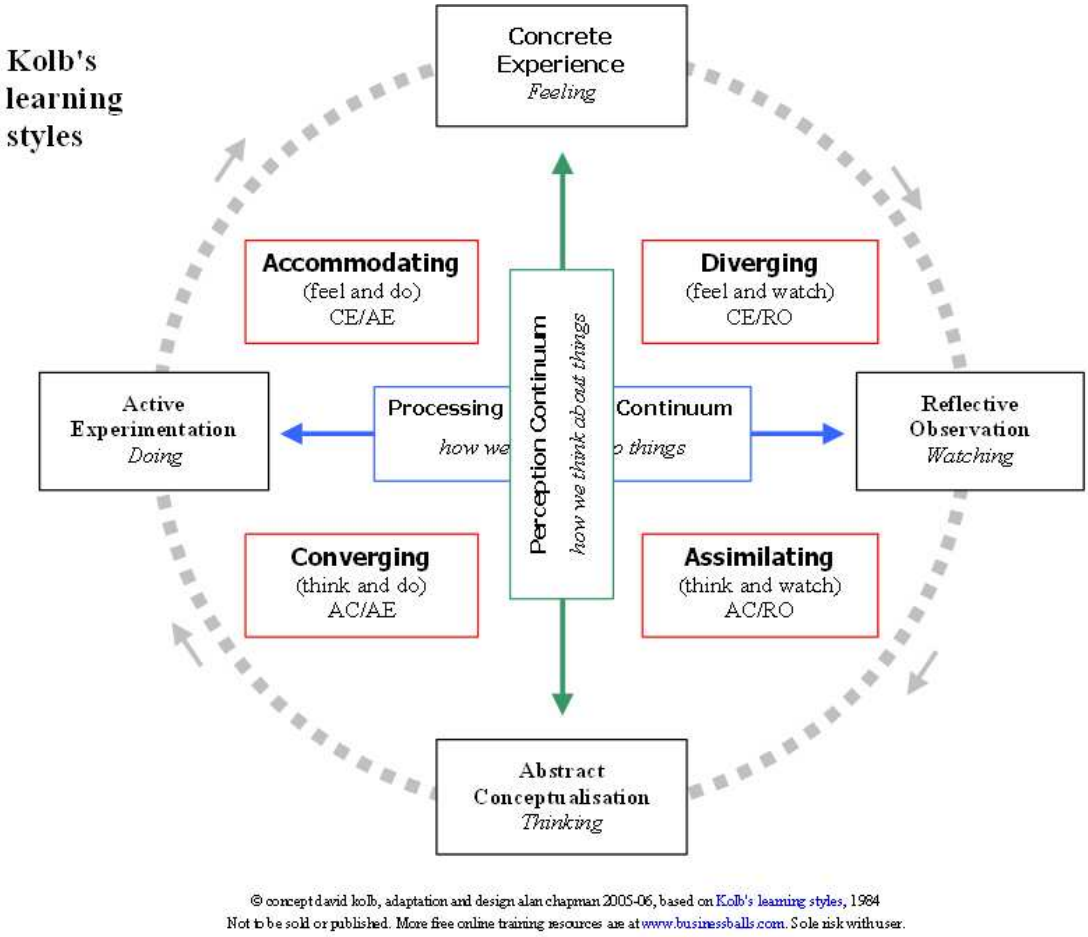

Figure 2.1 Kolb's experiential learning theory (learning styles) model (source: www.businessballs.com/freepdfmaterials/kolblearningstylesdiagram.pdf)

Learning Styles

Kolb explains that different people naturally prefer a certain single different learning style. Various factors influence a person's preferred style: notably in his experiential learning theory model (ELT) Kolb defined three stages of a person's development, and suggests that our propensity to reconcile and successfully integrate the four different learning styles improves as we mature through our development stages. The development stages that Kolb identified are:

Acquisition - birth to adolescence - development of basic abilities and cognitive structures

Specialization - schooling, early work and personal experiences of adulthood - the development of a particular specialized learning style shaped by social, educational, and organizational socialization

Integration - mid-career through to later life - expression of non-dominant learning style in work and personal life.

Whatever influences the choice of style, the learning style preference itself is actually the product of two pairs of variables, or two separate choices that we make, which Kolb presented as lines of axis, each with 'conflicting' modes at either end:

Concrete Experience - CE (feeling) -----V-----Abstract Conceptualization - AC (thinking)

Active Experimentation - AE (doing)-----V----- Reflective Observation - RO (watching)

A typical presentation of Kolb's two continuums is that the x axis is called the Processing Continuum (how we approach a task), and the y axis is called the Perception Continuum (our emotional response, or how we think or feel about it).

These learning styles are the combination of two lines of axis (continuums) each formed between what Kolb calls dialectically related modes of grasping experience (doing or watching), and transforming experience (feeling or thinking):

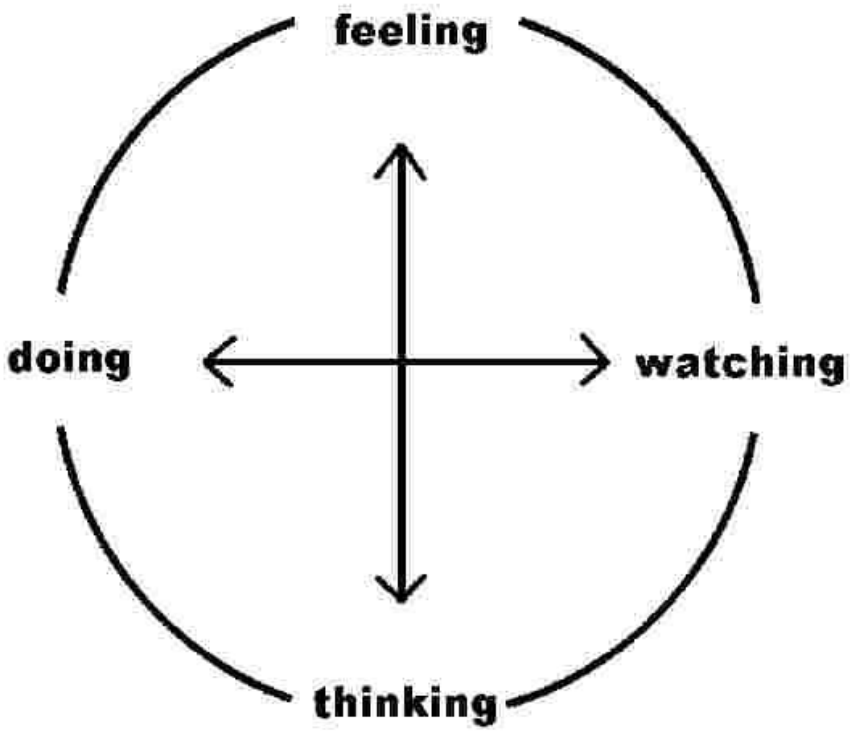

Figure 2.2 Kolb's grasping experience (doing or watching), and transforming experience (feeling or thinking) model. (source: www.businessballs.com /freepdfmaterials /kolblearningstylesdiagram.pdf)

The word dialectically is not widely understood, and yet carries an essential meaning, namely conflicting (the ancient Greek root means debate). Kolb meant by this that we cannot do both at the same time, and to an extent our urge to want to do both creates conflict, which we resolve through choice when confronted with a new learning situation. We internally decide whether we wish to do or watch, and at the same time we decide whether to think or feel.

The result of these two decisions produces (and helps to form throughout our lives) the preferred learning style, hence the two-by-two matrix below. We choose a way of grasping the experience, which defines our approach to it, and we choose a way to transform the experience into something meaningful and usable, which defines our emotional response to the experience. Our learning style is a product of these two choice decisions:

how to approach a task - i.e., grasping experience - preferring to (a) watch or (b) do , and

our emotional response to the experience - i.e., transforming experience - preferring to (a) think or (b) feel.

In other words we choose our approach to the task or experience (grasping the experience) by opting for 1(a) or 1(b):

1(a) - through watching others involved in the experience and reflecting on what happens (reflective observation - watching) or

1(b) - through jumping straight in and just doing it (active experimentation – doing)

And at the same time we choose how to emotionally transform the experience into something meaningful and useful by opting for 2(a) or 2(b):

2(a) - through gaining new information by thinking, analyzing, or planning (abstract conceptualization - thinking) or

2(b) - through experiencing the concrete, tangible, felt qualities of the world (concrete experience - feeling)

The combination of these two choices produces a preferred learning style. See the matrix below.

Kolb's Learning Styles - Matrix View

It's often easier to see the construction of Kolb's learning styles in terms of a two-by-two matrix. The diagram also highlights Kolb's terminology for the four learning styles; diverging, assimilating, and converging, accommodating:

Table 2.1 Kolb's learning styles - matrix view

	DOING (Active Experimentation - AE)	WATCHING (Reflective Observation - RO)
FEELING (Concrete Experience - CE)	accommodating (CE/AE)	diverging (CE/RO)
THINKING (Abstract Conceptualization - AC)	converging (AC/AE)	assimilating (AC/RO)

Thus, for example, a person with a dominant learning style of doing rather than watching the task, and feeling rather than thinking about the experience, will have a learning style which combines and represents those processes, namely an Accommodating learning style, in Kolb's terminology.

Kolb learning styles definitions and descriptions

Knowing a person's (and your own) learning style enables learning to be orientated according to the preferred method. That said, everyone responds to and needs the stimulus of all types of learning styles to one extent or another - it's a matter of using emphasis that fits best with the given situation and a person's learning style preferences.

Table 2.2 Kolb's learning styles

Diverging (feeling and watching - CE/RO) - These students are able to look at things from different perspectives. They are sensitive. They prefer to watch rather than do, tending to gather information and use imagination to solve problems. They are best at viewing concrete situations several different viewpoints. Kolb called this style Diverging because these students perform better in situations that require ideas-generation, for example, brainstorming. Students with a Diverging learning style have broad cultural interests and like to gather information. They are interested in people, tend to be imaginative and emotional, and tend to be strong in the arts. Students with the Diverging style prefer to work in groups, to listen with an open mind and to receive personal feedback.
Assimilating (watching and thinking - AC/RO) - The Assimilating learning preference is for a concise, logical approach. Ideas and concepts are more important than people. These students require good clear explanation rather than practical opportunity. They excel at understanding wide-ranging information and organising it a clear logical format. Students with an Assimilating learning style are less focused on people and more interested in ideas and abstract concepts. Students with this style are more attracted to logically sound theories than approaches based on practical value. These learning style students are important for effectiveness in information and science careers. In formal learning situations, students with this style prefer readings, lectures, exploring analytical models, and having time to think things through.
Converging (doing and thinking - AC/AE) - Students with a Converging learning style can solve problems and will use their learning to find solutions to practical issues. They prefer technical tasks, and are less concerned with people and interpersonal aspects. Students with a Converging learning style are best at finding practical uses for ideas and theories. They can solve problems and make decisions by finding solutions to questions and problems. Students with a Converging learning style are more attracted to technical tasks and problems than social or interpersonal issues. A Converging learning style enables specialist and technology abilities. Students with a Converging style like to experiment with new ideas, to simulate, and to work with practical applications.
Accommodating (doing and feeling - CE/AE) - The Accommodating learning style is 'hands-on', and relies on intuition rather than logic. These students use other people's analysis, and prefer to take a practical, experiential approach. They are attracted to new challenges and experiences, and to carrying out plans. They commonly act on 'gut' instinct rather than logical analysis. Students with an Accommodating learning style will tend to rely on others for information than carry out their own analysis. This learning style is prevalent and useful in roles requiring action and initiative. Students with an Accommodating learning style prefer to work in teams to complete tasks. They set targets and actively work in the field trying different ways to achieve an objective.

As with any behavioural model, this is a guide and not a strict set of rules.

Nevertheless most students clearly exhibit clear strong preferences for a given learning style. The ability to use or switch between different styles is not one that we should assume comes easily or naturally to many students.

Simply, students who have a clear learning style preference, for whatever reason, will tend to learn more effectively if learning is orientated according to their preference.

For instance - people who prefer the Assimilating learning style will not be comfortable being thrown in at the deep end without notes and instructions.

People who like prefer to use an Accommodating learning style are likely to become frustrated if they are forced to read lots of instructions and rules, and are unable to get hands on experience as soon as possible.

The Relationships Between Kolb and Other Behavioral/Personality Theories

As with many behavioral and personality models, interesting correlations exist between Kolb's theory and other concepts.

For example, Kolb says that his experiential learning theory, and therefore the learning styles model within it, builds on Carl Jung's assertion that learning styles result from people's preferred ways of adapting in the world.

Among many other correlations between definitions, Kolb points out that Jung's 'Extraversion/Introversion' dialectical dimension - (which features and is measured in the Myers-Briggs Type Indicator [MBTI]) correlates with the 'Active/Reflective' (doing/watching) dialectic (x-axis continuum) of Kolb's model.

Also, the MBTI 'Feeling/Thinking' dimension correlates with the Kolb model Concrete Experience/Abstract Conceptualization dimension (y-axis continuum).

Honey and Mumford's Variation on the Kolb System

Various resources refer to the terms 'activist', 'reflector', 'theorist', and 'pragmatist' (respectively representing the four key stages or learning steps) in seeking to explain Kolb's model. In fact, 'activist', 'reflector', 'theorist', and 'pragmatist' are from a learning styles model developed by Honey and Mumford (H&M), which although based on Kolb's work, is different. Arguably therefore the terms 'activist', 'reflector', 'theorist', and 'pragmatist' effectively 'belong' to the Honey and Mumford theory.

Peter Honey and Alan Mumford developed their learning styles system as a variation on the Kolb model while working on a project for the Chloride corporation in the 1970's. Honey and Mumford say of their system:

"Our description of the stages in the learning cycle originated from the work of David Kolb. Kolb uses different words to describe the stages of the learning cycle and four learning styles..."

And, "...The similarities between his model and ours are greater than the differences.." (Honey, Mumford, 1982)

In summary here are brief descriptions of the four H&M key stages/styles, which incidentally are directly mutually corresponding and overlaid, as distinct from the Kolb model in which the learning styles are a product of combinations of the learning cycle stages. The typical presentation of these H&M styles and stages would be respectively at north, east, south and west on a circle or four-stage cyclical flow diagram.

'Having an Experience' (stage 1), and Activists (style 1): 'here and now', gregarious, seek challenge and immediate experience, open-minded, bored with implementation.

'Reviewing the Experience' (stage 2) and Reflectors (style 2): 'stand back', gather data, ponder and analyse, delay reaching conclusions, listen before speaking, thoughtful.

'Concluding from the Experience' (stage 3) and Theorists (style 3): think things through in logical steps, assimilate disparate facts into coherent theories, rationally objective, reject subjectivity and flippancy.

'Planning the next steps' (stage 4) and Pragmatists (style 4): seek and try out new ideas, practical, down-to-earth, enjoy problem solving and decision-making quickly, bored with long discussions.

There is arguably a strong similarity between the Honey and Mumford styles/stages and the corresponding Kolb learning styles:

- Activist = Accommodating
- Reflector = Diverging
- Theorist = Assimilating
- Pragmatist = Converging

Applications of Learning Styles in the Classroom

Various researchers have attempted to provide ways in which learning style theory can take effect in the classroom. (Dunn and Dunn, 1978).

They give a background of how learners are affected by elements of the classroom and follow it with recommendations of how to accommodate students learning strengths. Dunn and Dunn write that "learners are affected by their: (1) immediate environment (sound, light, temperature, and design); (2) own emotionality (motivation, persistence, responsibility, and need for structure or flexibility); (3) sociological needs (self, pair, peers, team, adult, or varied); and (4) physical needs (perceptual strengths, intake, time, and mobility)".

They analyse other research and make the claim that not only can students identify their preferred learning styles, but that students also score higher on tests, have better attitudes, and are more efficient if they are taught in ways to which they can more easily relate. Therefore, it is to the educator's advantage to teach and test students in their preferred styles.

Although learning styles will inevitably differ among students in the classroom, Dunn and Dunn say that teachers should try to make changes in their classroom that will be beneficial to every learning style. Some of these changes include room redesign, the development of small-group techniques and the use of other interactive teaching methods. Redesigning the classroom involves locating dividers that can be used to arrange the room creatively (such as having different learning stations and instructional areas), clearing the floor area, and incorporating student thoughts and ideas into the design of the classroom.

Small-group techniques often include a "circle of knowledge" in which students sit in a circle and discuss a subject collaboratively as well as other techniques such as team learning, brainstorming and the creation of scenario's.

Another scholar who believes that learning styles should have an effect on the classroom is Marilee Sprenger, 2003, as evidenced by her book, Differentiation through Learning Styles and Memory.

Sprenger bases her recommendations for classroom learning on three premises: 1) Teachers can be learners, and learners can be teachers. We are all both. 2) Everyone can learn under the right circumstances. 3) Learning is fun! Make it appealing.

She details various ways in which teachers can teach so that students will remember. She categorizes these teaching methods according to which learning style they fit—visual, auditory, or tactile/kinesthetic.

Methods for visual learners include ensuring that students can see words written down, using pictures when describing things, drawing time lines for events in history, writing assignments on the board, using PPP or overhead transparencies, and writing down instructions.

Methods for auditory learners include repeating difficult words and concepts aloud, incorporating small-group discussion, organizing debates, listening to books on tape, writing oral reports, and encouraging oral interpretation.

Methods for tactile/kinesthetic learners include providing hands-on activities (experiments, etc.), assigning projects, having frequent breaks to allow movement, using visual aids and objects in the lesson, using role play, and having field trips.

View According to Vermunt

The view according to a dutch researcher, Vermunt, currently working as professor of teaching and teacher Education at the institute of teaching, university of Utrecht, is that instruction, or training as used in this paper, does not lead to learning automatically. That the learning activities that students employ determine to a large extent the quality of the learning outcomes they achieve. Therefore training should be directed at encouraging students to use high-quality learning activities. Learning activities can be viewed as thinking activities that people employ to learn, learning strategies in particular, are often used combinations of learning activities. Learning styles are conceived as stable, but not unchangeable ways in which students learn. The majority of study strategies research in higher education has focused on cognitive processing strategies and motivation (Schmeck, 1983; Entwistle and Ramsden, 1983). Recently, in research on learning processes of secondary school students, attention has been drawn to the importance of metacognition (e.g. Brown, 1987). Metacognition refers to learners' views and beliefs about learning and to the active regulation of their learning processes (Flavell, 1987).

Table 2.3. Learning activities: Types and Categories

Types	Categories
Cognitive	Relating, structuring, analyzing, concretizing, applying, memorizing, critical processing, selecting.
Affective	Attributing, motivating, concentrating, judging oneself, appraising, exerting effort, generating emotions, expecting.
Regulative	Orienting, planning, monitoring, testing, diagnosing, adjusting, evaluating, reflecting.

source: Vermunt, J.D., 1996

In general, three types of learning activities are discerned: cognitive, affective and metacognitive or regulative (Short, Weisberg-Benchell, 1989). A study of the literature indicated that these learning activities may be grouped into the categories depicted in Table 1 (Vermunt, 1989; 1992). Cognitive processing activities are those thinking activities that people use to process learning content. They lead directly to learning results in terms of knowledge, understanding, skill and so on. Examples are: looking for relations among parts of the subject matter (relating), distinguishing main and minor points (selecting), thinking of examples (concretizing) and looking for applications (applying). Affective learning activities are directed at coping with the feelings that arise during learning, and lead to an emotional state that may positively, neutrally or negatively affect the progression of a learning process. Examples are motivating oneself, attributing

learning results to causal factors, attaching subjective appraisals to learning tasks and getting blocking emotions under control. Metacognitive regulation activities are directed at regulating the cognitive and affective learning activities and therefore indirectly lead to learning results. Examples are: orienting on a learning task, monitoring whether the learning process proceeds as planned, diagnosing the cause of difficulties and adjusting learning processes when needed. In considering these activities, it is striking to observe that these are thinking activities that people not only need to learn, but also need to do their job. In functional descriptions these terms are often used: somebody with analytic skills, someone who knows how to readily discern relevant from irrelevant information, has the capability to make knowledge usable, can motivate oneself and others, can independently plan and monitor work activities, and so on. In reading personnel advertisements in newspapers it is remarkable that for many senior jobs, it is seemingly ever less important what academic subject someone has qualified in (e.g. 'an academic education'), if only the candidate has these thinking skills. In modem times, and in face of the increasing redundancy of knowledge, it is also less important which specific domain knowledge someone has acquired. It is obviously more important that people acquire skill in thinking activities that make them capable of assimilating new knowledge in order to deal with the huge amounts of information that they are confronted with in their work. The societal demand on higher education to pay more attention to 'teaching how to learn and think independently' is increasing.

Another striking attribute of the categories of learning activities described in Table 2.2 is that they can also be related to instructional activities. What teachers do to teach people something can be described in the same terms; they explain the relations among learning content, provide examples, show how a theory may be applied in practice, motivate students, and plan, monitor and evaluate the learning processes of students. It seems that learning and instructional activities can be seen as images of each other and that they may be described in similar terms. Thus, one can speak of learning functions; functions that have to be fulfilled for worthwhile learning processes to be realized (compare Shuell, 1988). Who fulfils these functions, the learner or the teacher, may vary, if only they are fulfilled. When some functions are not fulfilled one may speak of incomplete learning processes, which is often the case.

From the viewpoint of the influence of instructional activities on students' use of learning activities, three basic instructional strategies can be discerned: taking over, or substituting, learning and thinking activities from students (strong external control); activating students to use certain learning and thinking activities (shared control); and capitalizing on the proper use of learning and thinking activities that students already possess (loose external control). In the first case the teacher, for example, explains all relations between two theories, in the second case instruction stimulates students to search for relations between the theories. In the third case the teacher pays no attention to the relations between the theories, and he or she expects from the students that they will search and find those relations themselves. The question now arises as to whether certain psychological laws may be discovered in the way that people utilize various learning activities. Is the employment of some learning activities associated with the use of others? Can learning strategies be identified, consisting of typical combinations of thinking activities? As stated above, active 'on-line' regulation of learning is one aspect of metacognition; it is the more dynamic aspect. Another aspect is more static in nature; the knowledge, beliefs, conceptions and views people have about learning processes, the functioning of one's own thinking and the variables that influence these processes. In the first years of metacognitive research many studies were based on a presumption of knowledge related to specific facts people have about learning, such as the duration and capacity of short term memory. More recently the total, coherent system of conceptions of learning and associated phenomena are more in focus; the mental models of learning that people possess. These learning conceptions refer to, for example, conceptions of learning and thinking activities, conceptions of oneself as a learner, conceptions of

learning objectives and learning tasks, conceptions of learning and studying in general and regulation conceptions: views on the task division between oneself and others in learning processes (e.g. Volet, 1990; Marton, Dall'Alba and Beaty, 1993; Prosser, Trigwell and Taylor, 1994). Aspects of student learning that are well researched are study motivation (Entwistle & Ramsden, 1983) and learning orientations (Gibbs, Morgan & Taylor, 1984). Learning orientations refer to the whole domain of personal goals, intentions, attitudes, worries and doubts of students in relation to their studies. They are supposed to influence learning because students, within the repertoire of learning activities they master, mainly use those activities they think are best suited to realize their personal goals. Little is, however, known about the interplay between self-regulation and external regulation of learning. This, for example, refers to the way in which students interpret, appraise and use external regulation devices (didactic measures), dependent on their mental models of learning, learning orientations and skills in learning. It is often supposed that didactic measures like learning objectives, assignments, self-tests, directions for studying, and so on, are desirable devices for the improvement of student learning. The regulation power of these types of teaching devices, especially in instructional design theories, is presumed, but rarely empirically studied. The actual influence of these external regulation devices on students' use of study strategies, and how this influence is mediated by students' mental learning models and learning orientations, remains unclear.

What has also remained unclear until now are the interrelations among students' processing strategies, regulation strategies, mental learning models and learning orientations. These interrelations are referred to here in terms of the concept of 'learning style'. The term 'learning style' is usually used in a narrower sense, for example, in the sense of the learning activities students usually employ to learn (e.g. Moran, 1991). Here the concept is used in a broader sense, and also includes students' mental models of learning and learning orientations. 'Learning style' means here a coherent whole of learning activities that students usually employ, their learning orientation and their mental model of learning; a whole that is characteristic of them at a certain period. Within this broader meaning learning style is thus a coordinating concept, in which the interrelations among cognitive, affective and regulative learning activities, mental models of learning and learning orientations are united. Learning style is not conceived of as an unchangeable personality attribute, but as the result of the temporal interplay between personal and contextual influences.

From the above it is clear that learning functions play a central role in the theory on regulation of learning processes (Vermunt, 1989, 1992). However, little is known about the manner in which students carry out these functions in a real educational context, and about the way in which this execution is regulated by internal and external sources. According to Vermunt (2006) Insight into these processes can make an important contribution to the improvement of instructional practice in higher education, because, in line with the foregoing argument, the learning and thinking activities of students should be taken as a starting point in designing instruction.

By using a variety of teaching methods from each of these categories, teachers are able to accommodate different learning styles.

Students evaluations of teaching

In North America, the practice of obtaining student feedback on individual teachers and course units is widespread. Marsh and Dunkin (1992) identified four purposes for collecting students' evaluations of teaching (SET's):

- Diagnostic feedback to teachers about the effectiveness of their teaching.
- A measure of teaching effectiveness to be used in administrative decision making.
- Information for students to use in the selection of course units and teachers.
- An outcome or process description for use in research on teaching.

Marsh and Dunkin noted that the first purpose was essentially universal in North America, but the other three were not:

At many universities systematic student input is required before faculty are even considered for promotion, while at others the inclusion of SET's is optional or not encouraged at all. Similarly, in some universities the results of SET's are sold to students in university bookstores as an aid to the selection of courses or instructors, whereas the results are considered to be strictly confidential at other universities. (1992, p. 143)

The feedback in question usually takes the form of students' ratings of their level of satisfaction or their self-reports of other attitudes towards their teachers or their course units. The feedback is obtained by means of standard questionnaires, the responses are automatically scanned, and a descriptive summary of the responses is returned to the relevant teacher and, if appropriate, the teacher's head of department.

The process is relatively swift, simple and convenient for both students and teachers, and in most North American institutions it appears to have been accepted as a matter of routine. It has, however, been described as a 'ritual' (Abrami *et al.*, 1996, p. 213), and precisely for that reason it may not always be regarded as a serious matter by those involved. In many institutions, the instruments used to obtain student feedback have been constructed and developed in-house and may never have been subjected to any kind of external scrutiny. Marsh (1987) described five instruments that had received some kind of formal evaluation and others have featured in subsequent research.

The instrument that has been most widely used in published work is Marsh's (1982) Students' Evaluations of Educational Quality (SEEQ). In completing this questionnaire, students are asked to judge how well each of 35 statements (for instance, 'You found the course intellectually stimulating and challenging') describes their teacher or course unit, using a five-point scale from 'very poor' to 'very good'. The statements are intended to reflect nine aspects of effective teaching: learning/ value, enthusiasm, organization, group interaction, individual rapport, breadth of coverage, examinations/grading, assignments and workload/difficulty. The evidence using this and other similar questionnaires has been summarized in a series of reviews (Marsh, 1982, 1987; Arubayi, 1987; Marsh & Dunkin, 1992; Marsh & Bailey, 1993).

The test-retest reliability of students' evaluations is high, even when there is an extended period between the two evaluations. The interrater reliability of the average ratings given by groups of students is also high, provided that the average is based on 10 or more students. [Interrater reliability is the extent to which two or more individuals (coders or raters) agree. Interrater reliability addresses the consistency of the implementation of a rating system]. There is a high correlation between the ratings produced by students taking *different* course units taught by the *same* teacher, but little or no relationship between the ratings given by students taking the *same* course unit taught by *different* teachers. This suggests that students' evaluations are a function of the person teaching the course unit rather than the particular unit being taught.

Evaluations of the same teachers given by successive cohorts of students are highly stable over time. Indeed, Marsh and Hocevar (1991b) found no systematic changes in students' ratings of 195 teachers over a 13-year period. Although this demonstrates the stability of the students' ratings, it also implies that the performance of the teachers was not improving with experience. Nevertheless, Roche and Marsh (2002) found that teachers' perceptions of their own teaching became more consistent with their students' perceptions of their teaching as a result of receiving feedback in the form of students' evaluations. In other words, students' evaluations may change teachers' self-perceptions even if they do not change their teaching behaviour.

The factor structure of the SEEQ has been confirmed in several studies. In particular, Marsh and Hocevar (1991) showed that it was invariant across teachers of different status and across course units in different disciplines and at different levels. There is a consensus that students' ratings of teaching effectiveness vary on a large number of dimensions, but there is debate as to whether these can be subsumed under a single, more global dimension. Marsh (1991; Marsh & Dunkin, 1992; Marsh & Roche, 1997) argued that, although students' scores on the dimensions of the SEEQ were correlated with each other, they could not be adequately captured by a single higher-order factor. On the other hand, Abrami and d'Apollonia (1991; Abrami *et al.*, 1996; d'Apollonia & Abrami, 1997) proposed that students' evaluations of teaching were subsumed by a single overarching construct that they defined as 'general instructional skill'.

The fact that students' evaluations of teachers are correlated with the teachers' self evaluations also constitutes evidence for their validity. In fact, teachers' self-evaluations exhibit essentially the same factor structure as their students' evaluations, teachers self-evaluations are correlated with their students' evaluations on each individual dimension of the SEEQ, and teachers' self-evaluations are not systematically different from their students' evaluations (see Marsh, 1987). Students' evaluations of their teachers are not highly correlated with evaluations provided by *other* teachers on the basis of classroom observation, but both the reliability and the validity of the latter evaluations have been questioned. There is better evidence that SET's are correlated with ratings of specific aspects of teaching by trained observers (see Murray, 1983). In principle, the validity of students' evaluations might be demonstrated by finding correlations between SET's and academic performance. However, the demands and the assessment criteria of different course units may vary, and so students' grades or examination marks cannot be taken as a simple measure of teaching effectiveness.

One solution is to compare students' evaluations and attainment in a single course unit where different groups of students are taught by different instructors but are subject to the same form of assessment. In these circumstances, there is a clear relationship between SET's and academic attainment, even when the grades are assigned by an independent evaluator, although some aspects of teaching are more important in predicting attainment than others (Cohen, 1981; Marsh, 1987).

The relationship between SET's and academic attainment is stronger when students know their final grades, though there is still a moderate correlation if they provide their ratings before their final grades are known (Cohen, 1981). Greenwald and Gilmore (1997a, b) noted that in the latter case the students can acquire expectations about their final grades from the results of midterm tests. They found a *positive* relationship between students' expected grades and their overall ratings of their teaching but a *negative* relationship between students' expected grades and their estimated workload. They argued that students reduced their work investment in order to achieve their original aspirations when faced with lenient assessment on their midterm tests.

The latter research raises the possibility that SET's might be biased by the effects of extraneous background factors, a possibility that is often used to foster skepticism about the value of SET's in the evaluation of teaching in higher education (Husbands & Fosh,

1993). Marsh (1987) found that four variables were potentially important in predicting SET's: the students' prior interest in the subject matter; their expected grades; their perceived workload; and their reasons for taking the course unit in question.

Nevertheless, the effects of these variables upon students' ratings were relatively weak and did not necessarily constitute a bias. For instance, course units that were perceived to have a higher workload received more positive ratings, and the effect of prior interest was mainly on what students said they had learned from the course unit rather than their evaluation of the teaching *per se* (see Marsh, 1983).

Marsh (1987) acknowledged in particular that more positive SET's might arise from the students' satisfaction at receiving higher grades (the *grading satisfaction hypothesis*) or else from other uncontrolled characteristics of the student population.

The fact that the relationship between SET's and academic attainment is stronger when the students know their final grades is consistent with the grading satisfaction hypothesis. However, Marsh pointed out that, if students are taught in different groups on the same course unit, they may know how their attainment compares with that of the other students in their group, but they have no basis for knowing how their attainment compares with that of the students in other groups. Yet the correlation between SET's and academic attainment arises even when it is calculated from the average SET's and the average attainment across different groups, and even when the different groups of students do not vary significantly in terms of the grades that they expect to achieve. Marsh argued that this was inconsistent with the grading satisfaction hypothesis and supported the validity of SET's.

Although the SEEQ has been most widely used in North America, it has also been employed in investigations carried out in Australia, New Zealand, Papua New Guinea and Spain (Marsh, 1981, 1986; Clarkson, 1984; Marsh *et al.*, 1985; Watkins *et al.*, 1987; Marsh & Roche, 1992). The instrument clearly has to be adapted (or translated) for different educational settings and in some of these studies a different response scale was used. Even so, in each case both the reliability and the validity of the SEEQ were confirmed.

In a trial carried out by the Curtin University of Technology Teaching Learning Group (1997), the SEEQ was found to be far more acceptable to teachers than the existing in-house instrument. Coffey and Gibbs (2001) arranged for a shortened version of the SEEQ containing 24 items from six scales) to be administered to students at nine universities in the UK. The results confirmed the intended factor structure of this inventory and also showed a high level of internal consistency.

Because cross-cultural research tended to confirm the factor structure of the SEEQ, Marsh and Roche (1994) argued that it was especially appropriate for the increasingly multicultural student population attending Australian universities.

In a further study, Coffey and Gibbs (in press) asked 399 new teachers from eight countries to complete a questionnaire about their approaches to teaching. They found that those teachers who adopted a student-focused or learning-centred approach to teaching received significantly higher ratings from their students on five of the six scales in the shortened SEEQ than did those teachers who adopted a teacher-focused or subject-centred approach to teaching. In the case of teachers who had completed the first semester of a training programme, Coffey and Gibbs (2000) found that their students gave them significantly higher ratings on four of the six scales in the shortened SEEQ at the end of the semester than they had done after four weeks. Nevertheless, this study suffered from a severe attrition of participants, and it is possible that the latter effect was simply an artifact resulting from sampling bias.

Equally, the students may have given more positive ratings simply because they were more familiar with their teachers.

SET's are most commonly obtained when teaching is face-to-face and is controlled by a single lecturer or instructor. It has indeed been suggested that the routine use of questionnaires to obtain students evaluations of their teachers promotes an uncritical acceptance of traditional conceptions of teaching based on the bare transmission of knowledge and the neglect of more sophisticated conceptions concerned with the promotion of critical thinking and self-expression (Kolitch and Dean, 1999). It should be possible to collect SET's in other teaching situations such as the supervision of research students, but there has been little or no research on the matter.

A different situation is that of distance education, where students are both physically and socially separated from their teachers, from their institutions, and often from other students too (Kahl & Cropley, 1986). To reduce what Moore (1980) called the 'transactional distance' with their students, most distance-learning institutions use various kinds of personal support, such as tutorials or self-help groups arranged on a local basis, induction courses or residential schools, and teleconferencing or computer conferencing. This support seems to be highly valued by the students in question (Hennessy *et al.*, 1999; Fung & Carr, 2000). Nevertheless, it means that 'teachers' have different roles in distance education: as authors of course materials and as tutors. Gibbs and Coffey (2001) suggested that collecting SET's in distance education could help to clarify the expectations of both tutors and students about the nature of their relationship.

Marsh and Roche (1994) elaborated the SEEQ as the core of a self development package for university teachers that incorporates a self-rating questionnaire for teachers, a guide to interpreting the students' overall evaluations, and booklets on improving teaching effectiveness in areas where evaluations identify scope for improvement. They offered advice on how this package might be adopted in programmes at other institutions. Marsh (1987) concluded that 'student ratings are clearly multidimensional, quite reliable, reasonably valid, relatively uncontaminated by many variables often seen as sources of potential bias, and are seen to be useful by students, faculty, and administrators' (p. 369). The literature that has been published over the subsequent period has confirmed each of these points and has also demonstrated that student ratings can provide important evidence for research on teaching. The routine collection of students evaluations does not in itself lead to any improvement in the quality of teaching (Kember *et al.*, 2002). Nevertheless, feedback of this nature may help in the professional development of individual teachers, particularly if it is supported by an appropriate process of consultation and counseling (Roche & Marsh, 2002). SET's do increase systematically following specific interventions aimed at improving teaching (Hativa, 1996).

Student Satisfaction Surveys

Perhaps the most serious limitation of the instruments that have been described above is that they have focused upon students' evaluations of particular course units in the context of highly modular programmes of study, and hence they provide little information about their experience of their programmes or institutions as a whole. In addition to collecting SET's for individual course units, many institutions in North America make use of commercially published questionnaires to collect comparative data on their students' overall satisfaction as consumers.

One widely used questionnaire is the Noel-Levitz Student Satisfaction Inventory, which is based explicitly on consumer theory and measures students' satisfaction with their experience of higher education. It contains either 76 items (for institutions offering two-year programmes) or 79 items (for institutions offering four-year programmes); in each case, respondents are asked to rate both the importance of their expectation about a particular aspect of higher education and their level of satisfaction. Overall scores are

calculated that identify aspects of the students experience where the institutions are failing to meet their expectations.

A similar approach has been adopted in in-house satisfaction surveys developed in the UK, but most have of these have not been adequately documented or evaluated. Harvey *et al.* (1997) described a general methodology for developing student satisfaction surveys based upon their use at the University of Central England. First, significant aspects of students' experience are identified from the use of focus groups. Second, these are incorporated into a questionnaire survey in which larger samples of students are asked to rate their satisfaction with each aspect and its importance to their learning experience. Finally, the responses from the survey are used to identify aspects of the student experience that are associated with high levels of importance but low levels of satisfaction. According to Harvey (2001), this methodology has been adopted at a number of institutions in the UK and in some other countries, too. Descriptive data from such surveys have been reported in institutional reports (see Harvey, 1995), but no formal evidence with regard to their reliability or validity has been published.

Students Perceptions of Academic Quality

From the perspective of an institution of higher education seeking to maintain and improve the quality of its teaching, it could be argued that the appropriate focus of assessment would be a programme of study rather than an individual course unit or the whole institution, and this has been the dominant focus in Australia and the UK.

In an investigation into determinants of approaches to studying in higher education, Ramsden and Entwistle (1981) developed the Course Perceptions Questionnaire (CPQ) to measure the experiences of British students in particular degree programmes and departments. In its final version, the CPQ contained 40 items in eight scales that reflected different aspects of effective teaching. It was used by Ramsden and Entwistle in a survey of 2208 students across 66 academic departments of engineering, physics, economics, psychology, history and English. A factor analysis of their scores on the eight scales suggested the existence of two underlying dimensions: one reflected the positive evaluation of teaching and programmes, and the other reflected the use of formal methods of teaching and the programmes vocational relevance.

The CPQ was devised as a research instrument to identify and to compare the perceptions of students on different programmes, and Ramsden and Entwistle were able to use it to reveal the impact of contextual factors on students' approaches to learning. However, the primary factor that underlies its constituent scales is open to a natural interpretation as a measure of perceived teaching quality, and Gibbs *et al.* (1988, pp. 29–33) argued that the CPQ could be used for teaching evaluation and course review. Even so, the correlations obtained by Ramsden and Entwistle between students' perceptions and their approaches to studying were relatively weak. Similar results were found by other researchers (Parsons, 1988) and this led to doubts being raised about the adequacy of the CPQ as a research tool (Meyer & Muller, 1990).

Ramsden (1991) developed a revised instrument, the Course Experience Questionnaire (CEQ), as a performance indicator for monitoring the quality of teaching on particular academic programmes. In the light of preliminary evidence, a national trial of the CEQ was commissioned by a group set up by the Australian Commonwealth Department of Employment, Education and Training to examine performance indicators in higher education (Linke, 1991). In this national trial, usable responses to the CEQ were obtained from 3372 final-year undergraduate students at 13 Australian universities and colleges of advanced education.

The instrument used in this trial consisted of 30 items in five scales which had been identified in previous research as reflecting different dimensions of effective instruction:

good teaching (8 items); clear goals and standards (5 items); appropriate workload (5 items); appropriate assessment (6 items); and emphasis on independence (6 items). The defining items of the five scales (according to the results of the national trial) are shown in Table 1. In addition, three of the items in the Appropriate Assessment scale could be used as a subscale to monitor the perceived importance of rote memory as opposed to understanding in assessment.

The respondents were instructed to indicate their level of agreement or disagreement (along a scale from 'definitely agree', scoring five, to 'definitely disagree', scoring one) with each statement as a description of their programme of study. Half of the items referred to positive aspects, whereas the other half referred to negative aspects and were to be scored in reverse. This means that the instrument as a whole controlled for any systematic responses biases either to agree with all of the items or to disagree with all of the items. (Unfortunately, the items to be scored in reverse were not distributed equally across the five CEQ scales.) As a result of this national trial, it was determined that the Graduate Careers Council of Australia (GCCA) should administer the CEQ on an annual basis to all new graduates through the Graduate Destination Survey, which is conducted a few months after the completion of their degree programmes. The survey of the 1992 graduates was carried out in 1993 and obtained usable responses to the CEQ from more than 50,000 graduates from 30 institutions of higher education (Ainley & Long, 1994). Subsequent surveys have covered all Australian universities and have typically obtained usable responses to the CEQ from more than 80,000 graduates.

Surveys for obtaining student feedback are now well established both in North America and in Australia. They have also become increasingly common in the UK and are about to become a fixture at a national level. Following the demise of subject-based review of the quality of teaching provision by the Quality Assurance Agency, a task group was set up in 2001 by the Higher Education Funding Council for England to identify the kinds of information that higher education institutions should make available to prospective students and other stakeholders. The group's report (commonly known as the 'Cooke report') proposed, amongst other things, that there should be a national survey of recent graduates to determine their opinions of the quality and standards of their experience of higher education (Information on quality, 2002, p. 15).

A project was set up by the Funding Council to advise on the design and administration of such a survey, which led in turn to the commissioning of a pilot study for a National Student Survey. This was carried out during the summer of 2003 using an inventory containing 48 items and obtained responses from 17,173 students at 22 institutions. Subsequently, however, the UK Government decided that it would be more efficient to survey students during, rather than after, their final year of study.

Conclusions from Literature

More generally, the published research literature leads one to the following conclusions:

- Student feedback provides important evidence for assessing quality, it can be used to support attempts to improve quality, and it can be useful to prospective students.
- The use of quantitative instruments is dictated by organizational constraints (and in distance education by geographical constraints, too).
- Feedback should be sought at the level at which one is endeavouring to monitor quality.
- The focus should be on students' perceptions of key aspects of teaching or on key aspects of the quality of their programmes.
- Feedback should be collected as soon as possible after the relevant educational activity.
- It is feasible to construct questionnaires with a very wide range of applicability. Two groups are problematic: postgraduate research students and distance-learning students. Curricular innovations might make it necessary to reword or more radically amend existing instruments. In addition, any comparisons among different course units or programmes should take into account the diversity of educational contexts and student populations.
- Response rates of 60% of more are both desirable and achievable for students who have satisfactorily completed their course units or programmes. Response rates may well be lower for students who have failed or who have withdrawn from their course units or programmes.
- Many students and teachers believe that student feedback is useful and informative, but many teachers and institutions do not take student feedback sufficiently seriously. The main issues are: the interpretation of feedback; institutional reward structures; the publication of feedback; and a sense of ownership of feedback on the part of both teachers and students.

Chapter 3

Methodology

A case study

Choice of research institutions

The PCA and CCA is representative of the five agricultural colleges involved with the ICATE project. They are located in two different provinces, 650 km apart, and contain students from different communities. The institutions were treated similarly under the ICATE project but CCA trainers underwent an additional interactive teaching course presented by a VHL trainer.

Gaining access

The researcher is employed at PCA and has been introduced to most of the trainers at CCA. The management of both colleges were informed of the research proposal and permission was granted beforehand. The trainers were approached by the researcher during the research period and personally requested their contributions. The students were requested by the relevant trainers to complete the questionnaires and by the researcher himself for the group interviews.

Selection of the Sample

The trainers were selected randomly and the students (20 per trainer) were the first who received the questionnaires. The largest class contained 35 students.

Informed Consent

All trainers and students were informed of the purpose of the questionnaires and interview beforehand. They were assured of their anonymity.

Interview Environment

The interviews with trainers took place in private in their own offices, and the student groups were interviewed in the library conference room.

Questionnaires

The *Approach to Teaching Inventory* (ATI) was used as an instrument to describe trainers approaches to teaching (Trigwell *et al*., 2005). Each questionnaire contains 22 items of which 11 refer to ITTF and 11 refer to CCSF.

A sample of six trainers at each of the colleges, Potchefstroom and Cedara, were required to complete the ATI and were then interviewed (semi-structured) separately.

The trainers were asked to describe their experiences with regard to the use of interactive, learning-by-doing and student centred teaching methods and also about the implementation of a CBL curriculum.

A Student Evaluation of Educational Quality (SEEQ) questionnaire, developed by Marsh, 1982, was given to 20 students of each of the above six trainers from PCA that also completed the ATI. The SEEQ is used as a routine instrument at many North American education institutions. The intellectual rights and copyright in the SEEQ belong to Professor Herbert W. Marsh of the University of Western Sydney, Macarthur. It is presented on a double sided form that allows for the inclusion of supplementary items and open-ended questions. If the SEEQ is administered in a class setting, respondents may be asked to record the course unit and the teacher being rated, but they themselves can remain anonymous.

The statements in the SEEQ questionnaire are all positive statements about the following indicators of successful teaching:

1. Learning
2. Enthusiasm
3. Organisation
4. Group interaction
5. Individual rapport
6. Breadth of teaching
7. Examinations
8. Assignments
9. Overall

To each of the statements students have to indicate the following on a Likert scale of 1 to 5:

Strongly Agree	= 1	"positive"
Agree	= 2	
Neutral	= 3	
Disagree	= 4	
Strongly Disagree	= 5	"negative"

The students were divided into groups of five to ten students to enhance group interaction, but not too large as to prevent quieter student comments from being heard. Four groups per college.

In these discussions they were encouraged to voice their feelings about the courses and teaching methods employed by their trainers.

An audio recording was made of each interview.

Indicators

Indicators for "successful" teaching:

- Fairness
- Positive attitude
- Preparedness
- Personal touch
- Sense of humour
- Creativity
- Willingness to admit mistakes
- Forgiving
- Respect
- High expectations
- Compassion

- Sense of belonging

(Thompson, Greer and Greer, 2004)

Indicators for "excellence" in teaching:

- facilitation of thinking
- facilitation of learning
- course organisation
- student support
- innovation
- postgraduate courses/students
- effective assessment
- scholarliness
- attitude
- course development

(Wood and Harding, 2007)

The indicators for "good trainers" identified by this researcher:

- Knowledgeable trainers
- Good course organisation (study notes and guides, all actions done timeously)
- Effective and fair assessment
- Teaching ability (use of various styles and methods)
- Compassionate and caring

Likert Scale

Both the ATI and SEEQ questionnaires make use of a Likert scale to indicate the agreement or non agreement of the respondents. For clarity sake the interpretation, understanding and analysis of a likert scale is discussed:

A **Likert scale** is a psychometric scale commonly used in questionnaires, and is the most widely used scale in survey research. When responding to a Likert questionnaire item, respondents specify their level of agreement to a statement. The scale is named after its inventor, psychologist Rensis Likert (Likert, 1932).

An important distinction must be made between a *Likert scale* and a *Likert item*. The Likert scale is the sum of responses on several Likert items. Because Likert items are often accompanied by a visual analog scale (e.g., a horizontal line, on which a subject indicates his or her response by circling or checking tick-marks), the items are sometimes called scales themselves. This is the source of much confusion; it is better, therefore, to reserve the term *Likert scale* to apply to the summated scale, and *Likert item* to refer to an individual item.

A Likert item is simply a statement which the respondent is asked to evaluate according to any kind of subjective or objective criteria; generally the level of agreement or disagreement is measured. Often five ordered response levels are used, although many

psychometricians advocate using seven or nine levels; a recent empirical study by John Dawes (2008) found that a 5- or 7- point scale may produce slightly higher mean scores relative to the highest possible attainable score, compared to those produced from a 10-point scale, and this difference was statistically significant. In terms of the other data characteristics, there was very little difference among the scale formats in terms of variation about the mean, skewness or kurtosis.

The format of a typical five-level Likert item is:

Strongly disagree

Disagree

Neither agree nor disagree

Agree

Strongly agree

Likert scaling is a bipolar scaling method, measuring either positive or negative response to a statement. Sometimes a four-point scale is used; this is a forced choice method since the middle option of "Neither agree nor disagree" is not available.

Likert scales may be subject to distortion from several causes. Respondents may avoid using extreme response categories (*central tendency bias*); agree with statements as presented (*acquiescence bias*); or try to portray themselves or their organization in a more favorable light (*social desirability bias*). Designing a scale with balanced keying (an equal number of positive and negative statements) can obviate the problem of acquiescence bias, since acquiescence on positively keyed items will balance acquiescence on negatively keyed items, but central tendency and social desirability are somewhat more problematic*. (According to the Encarta English Dictionary acquiescence means to agree or comply with something in a passive or reserved way).*

Chapter 4

Results

For the sake of focusing of the actual research questions I have decided to present the results according to the sub questions.

What experiences do students have with interactive, learning-by-doing and student centred teaching methods?

During the group interviews the students identified the following characteristics(indicators) that they associate with good trainers and the courses that they enjoyed (table 4.1):

Table 4.1 Indicators for good trainers

Cedara College of Agriculture:
• Knowledgeable trainers • Good organisation of course • Effective and fair assessment • Good teaching abilities • Friendly and caring person
Potchefstroom College of Agriculture:
• Knowledgeable trainers • Experienced trainers • Personal contact • Interested in students • Passion and commitment to subject • Good communication • Good organisation

The students made the following comments about how the trainers changed after completing the ToT at PTC+ in the Netherlands:

“now we can talk to our lecturers”, “the relationship is much stronger”

The students were overwhelmingly positive about the use of interactive, learning-by-doing and student centred teaching methods and some comments by students show that they prefer a CCSF approach, i.e. “we enjoy assessments which help us to understand the work”.

They stated frequently that they wanted and enjoyed class interaction. Although very rarely was interaction observed among students and what usually took place was interaction between the students and the trainer. i.e. “we like interaction in class”, “give

us an opportunity to get involved", "we like to work in groups", "it is good to get people from outside".

Students enjoyed practical work and emphasised the value and confidence it gave them when applying their knowledge to a specific assignment. Although learning-by-doing and experiential learning is unknown terminology to the students they paraphrase it in simpler terms. They specifically noted the projects where they were required to work in groups to accomplish some task where the outcome was seen only after a period of hard work and much effort. "we enjoy the steers and crop project", "the feasibility study is good for us" and "the third year is the most important year". The third year of study at both colleges are when the students have to work at a commercial farm(Potchefstroom) and complete several assignments related to the production systems, or they have to do a farm planning project together with practical training at the research farm in Cedara. This shows that experiential training is regarded as very important by the students. "Practical assessment is good for us to see if we are competent", "we would like to do more practicals".

Although the students came out very positive about student centred teaching methods some were also more passive and preferred the "older" ITTF style of teaching. "Facilitating is not so good, teaching is better", "information on the powerpoint slides should be in full".

It is also clear that some interactive teaching methods have not been used by trainers. "Problem based learning sounds like a good idea", "scenarios and case studies are only rarely used by some lecturers", "most lecturers only lecture and show PPP slides".

There were also some negative comments. "We don't understand the story about learning outcomes", "we feel intimidated if we did not have a chance to prepare for a specific topic", "lecturers should not read from the notes but should explain it to us", "the library, computers and internet should be available to us at all times", "the lectures take too long", "lecturers should come to class well prepared".

What results/outcomes are achieved with the use of interactive, learning-by-doing and student centred teaching methods?

It is difficult to ascribe specific results or outcomes to the use of various interactive, learning-by-doing and student centred teaching methods, but comments are frequently made by students about what they enjoy or do not enjoy and how they perceive the teaching environment.

The following comments support the use of the above named teaching methods: “we can talk to our lecturers”, “the relationship is much stronger”, “we enjoy assessments that help us to understand the work”, “we like interaction in class”, “we like to work in groups”, “give us an opportunity to get involved”, “the trainers should adapt to different trainers” and “practical assessments are good to see if we are competent”.

Some students however tend to need more guidance and find the interactive, learning-by-doing and student centred teaching methods difficult to cope with. The following statements by students refer to their unhappiness with the “new” teaching methods: “we don’t understand the story about learning outcomes”, “facilitating is not so good, teaching is better”, “information of slides should be in full”.

What experiences do trainers have with interactive, learning-by-doing and student centred teaching methods?

Personal interviews were held with twelve trainers, six each from PCA and CCA. The interviews were held after they had completed the ATI.

Table 4.2 Approach to Teaching of trainers at PCA and CCA

	Trainers											
	Potchefstroom College of Agriculture						Cedara College of Agriculture					
Approach	1	2	3	4	5	6	7	8	9	10	11	12
ITTF		**Yes**	Neutral	Neutral			Neutral	Neutral	**Yes**		Neutral	Neutral
CCSF	**Yes**				**Yes**	**Yes**				**Yes**		

From the ATI it was possible to distinguish between trainers who had an ITTF, CCSF or neutral approach towards teaching. It is possible for a trainer to have a high score for both of the approaches, but it is then regarded as neutral or balanced. In other words the trainer regards both an ITTF and a CCSF approach as important in his teaching.

It was possible to identify two trainers who were clearly ITTF and four trainers who were CCSF. It would have been interesting to have measured their approach to teaching before their ToT in the Netherlands to measure the impact of the training. The rest of the trainers did not conform to either an ITTF or CCSF approach and were thus classified as neutral.

In adopting a CCSF approach, *conceptual change/student focused,* teachers have a student-focused strategy with the aim of changing students ways of thinking about subject matter. They focus their attention on the students and monitor their perceptions, activity and understanding. Transmission is seen to be necessary, but rarely sufficient. They assume students construct their own knowledge, so the task of the trainer is also to challenge current ideas through questions, problems, discussion and presentation. This approach includes a mastery of teaching methods, including those associated with transmission.

In other contexts teachers work with a view where the focus is on what they do as teachers, or on the detail, individual concepts in the syllabus or textbook, or the teachers own knowledge structure, without acknowledgement of the students own knowledge or experience. They see their role as mainly transmitting information based upon that knowledge to their students. In adopting this *information transmission/teacher focused* (ITTF) approach to teaching, forward planning, good management skills, use of an armoury of teaching competencies and the ability to use information technology (IT) are seen as important.

No correlation between the approach to teaching of the trainer and the students evaluation of educational quality could be observed.

The CCA has an “in house” developed trainer and course evaluation system. It was possible to interpret their results so it could be compared with the SEEQ questionnaire.

Table 4.3 SEEQ and “in-house” evaluation system.

	Trainers											
	Potchefstroom College of Agriculture						**Cedara College of Agriculture**					
Indicators	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
1. Learning	2.0	1.7	3.4	2.0	1.6	3.1	1	2	2	2	2	1
2. Enthusiasm	2.1	1.8	3.8	2.1	1.4	3.0	1	2	1	3	2	1
3. Organisation	1.9	1.6	3.5	2.2	1.5	3.0	1	2	1	2	2	1
4. Group Interaction	1.6	1.9	2.6	2.0	1.4	3.1	1	2	2	3	2	2
5. Individual Rapport	1.7	1.5	2.5	2.2	1.6	2.9	2	2	1	2	2	2
6. Breadth	1.8	1.8	3.6	2.1	1.6	3.1	1	2	2	2	2	1
7. Examinations	2.0	2.0	3.0	2.6	1.7	3.3	1	3	2	3	2	1
8. Assignments	1.9	1.7	3.1	2.0	1.8	3.2						
9. Overall	1.8	1.4	3.5	1.9	1.5	3.1						
Average	**1.9**	**1.7**	**3.2**	**2.1**	**1.6**	**3.1**	**1.1**	**2.1**	**1.6**	**2.4**	**2.0**	**1.3**

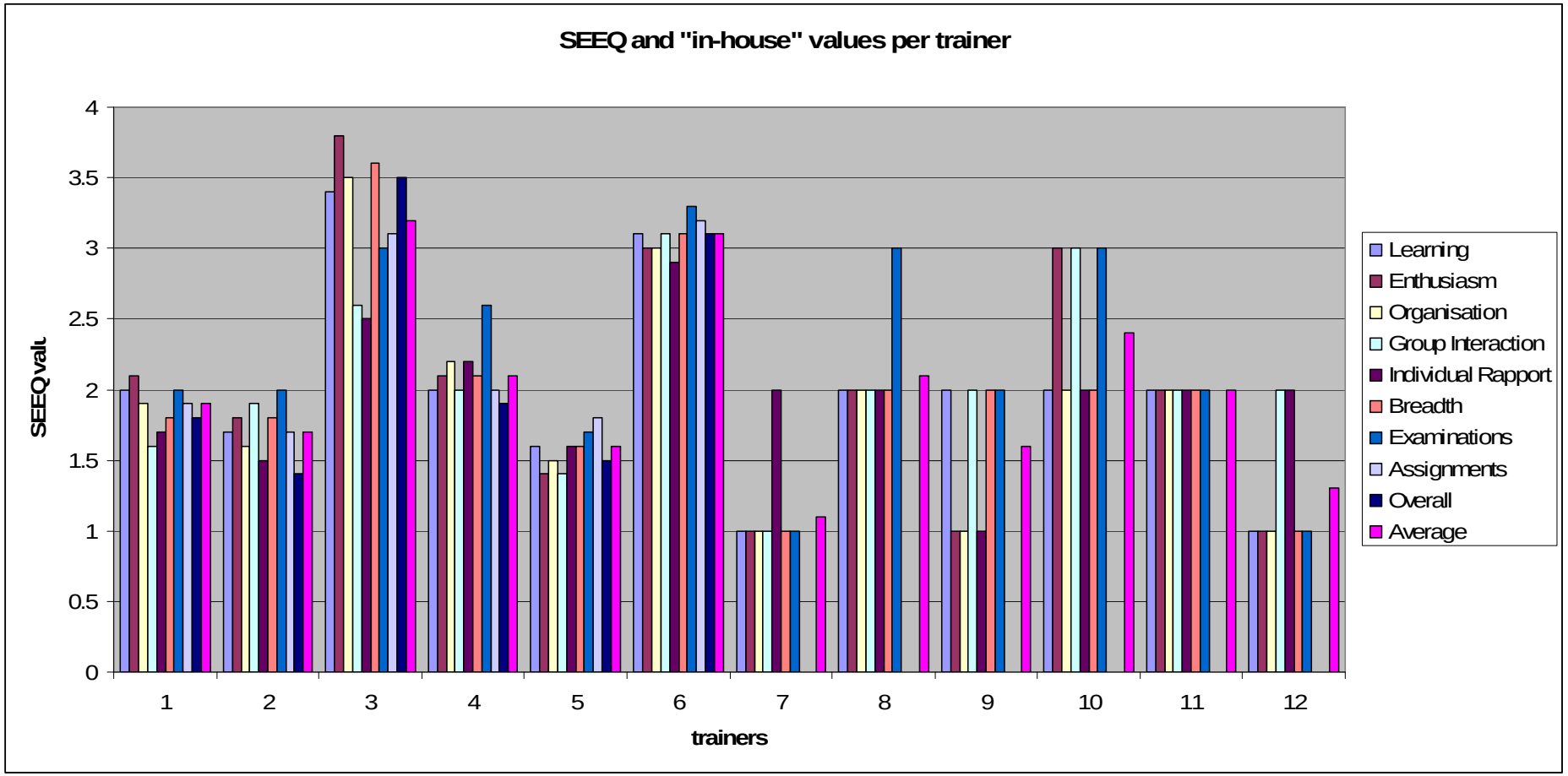

Figure 4.1 SEEQ and “in-house” evaluation of trainers at PCA and CCA

113 Student questionnaires (SEEQ) were completed. Two classes contained less than 20 students (15 and 18 respectively).

A combination of different sources, ATI, SEEQ or “in house” evaluation system and personal interviews, shed light on the teaching preferences and abilities of each evaluated trainer. It is thus relevant to describe each trainer numerically.

Trainer no.1 uses storytelling and humour as part of his teaching strategy and students indicated that they valued group interaction as his strongest point. At first glance he seems like a conventional trainer who uses powerpoint presentations(PPP) and lecturing as the main teaching method. One then realises that he has developed into a trainer that utilises his experience in practice to make the subject interesting. He refers to prior knowledge and uses questions to help them recall what they already know. Interaction between the trainer and students are evident but no communication takes place among students. Wrapping up by summarising and looking forward to the next lesson takes place. He has a CCSF approach.

Trainer no.2 indicates that it is very important to him that a course is well organised. “Module organisation is very important to me”. It can be seen in the good points he received from the students for the organisation indicator. His individual rapport and overall scores were also excellent. He makes use of PPP and includes pictures of farming practices to illustrate the practical application. “I expose students to practice” and “my assignments are problem based” illustrates that he values learning-by-doing and tries to help students to apply their knowledge. He makes use of video’s to illustrate basic handling practices in commercial sector. “I would like to make more use of interactive teaching methods but our lecturing facilities do not allow for groups to work separately”. He has produced a comprehensive study guide for his course and hands out notes for each chapter separately. He has an ITTF approach.

Trainer no.3 uses PPP in a conventional manner and reads continuously from the slides. She has little confidence in the subject she is presenting and cannot answer most of the asked questions. Her SEEQ shows that there was no indicator in which the students were satisfied. It is clearly a problem situation. She has a neutral approach to teaching.

Trainer no.4 uses discussions and group work as basis of her teaching method. She scored well on the overall indicator but students did not single out any indicator that she was particularly successful in. “I value understanding and the practical application of knowledge most of all”. It is evident that she would function well with smaller groups of students who have to apply their knowledge in the development of new skills. She has a neutral approach to teaching.

Trainer no.5 has a strong personality and is a convincing and eloquent speaker. All of his indicators are positive and the general impression from student evaluation is very positive. Questions to students as a group link with prior knowledge on the subject. Discussion, examples and scenario’s from the commercial sector are used throughout his lecture. Students interact with trainer but not among themselves. Wrapping up takes the form of summarising what was done during the lecture.

“Experiential learning forms the backbone of third year, and cannot be replaced by a third year on the research farm”(with reference to the PCA third year). “The principles on which CBL is based has been applied at the PCA since I can remember”. “The final evaluation of the third year is based on an on-farm assessment by the relevant trainers and an evaluation by the owner of the commercial farm about the competence of the student”. He has a CCSF approach to training.

Trainer no.6 often uses scenario’s and case studies to teach his subject and let’s the students divide into groups of three to work on assignments. “Most of my lectures are presented using PPP”. “I give more assignments to my students”. “Integration of subjects

should work well". "It is important that students are exposed to the real situation on a commercial farm and get a chance to see for themselves how the financial system operates". He has a CCSF approach to training

Trainer no.7 is very enthusiastic and highly motivated. She has an excellent individual rapport with her students and her scores on the evaluation system points to overall success. She is always well prepared for her classes and makes sure she has time for her students. "Communication is very important to me". "I believe that CBL is essential for the future of our college". She has a neutral approach to training but regards both the ITTF and CCSF approach as important.

Trainer no.8 has many years of experience in the commercial farming sector but has only recently joined the training team of CCA. He does not use PPP and instead uses the black board. "I talk informally and discuss subject". He provides students with a study guide and notes. "Students have to learn independently". "It is important for students to understand". "Learning-by-doing is an important part of my teaching". "Problem based learning forms part of my interactive teaching style". "The feasibility study forms part of my course". "It will be important to integrate subjects as part of CBL". His evaluation shows that he has been successful and that only the examinations indicator needs improvement. He has a neutral approach to teaching.

Trainer no.9 is a young trainer in his second year of teaching. He uses PPP as a basic tool in lecturing but does not rely on it exclusively. He does not provide the students with any notes but does however provide them with a copy of all his PPP slides. "I find it difficult to coach students, and prefer to help them learn and understand everything". "Interactive teaching has to be adapted to different cultures". His student evaluation shows that he has been very successful and all indicators are positive. He has an ITTF approach to teaching.

Trainer no.10 has good leadership qualities and makes extensive use of interactive teaching methods. "Teaching as a whole should be made more interactive". "I use a problem based approach in all my teaching". "CBL is a great approach but has to be adapted to SA conditions". She is an enthusiastic proponent of the CBL curriculum but are however also realistic when it comes to implementing CBL. "Students are not used to the new teaching methods". "Group work does not always work as well as you expect". "We have too many students in our classes". "The farming facilities have to be upgraded before we can implement CBL". She has a CCSF approach to teaching.

Trainer no.11 uses PPP and group work as basis of his teaching method. "I enjoy the interactive teaching method and think that we expect too little from our students". "I use case studies to bring the students closer to real farming". "Learning-by-doing is the only way they will gain confidence in their farming ability". He scored well on all indicators and according the students has no lack in any indicator. He has a neutral approach to teaching.

Trainer no.12 "I lecture mostly and always make use of PPP". "Tutorials are important for understanding in my subject and corresponds with learning-by-doing". "I often use case studies and require the students to report their results in front of the class". "Role-play is often used to illustrate real world situations". "I employ various methods of assessment". It can be seen from her remarks that she uses many interactive teaching methods and also gets an excellent evaluation from the students. She also has the following to say about the CCA: "We have too many students in our classes", "mathematics and English is a problem to our students, especially the first years", "first year want to be spoon fed" and "I am not satisfied with the current lecturer and course evaluation system". She has a neutral approach to teaching.

The results from the in-house student evaluation system from CCA was transformed into a comparable format for interpretation purposes (Table 4.2).

If we interpret the evaluation system results in the following way:

1.0 to 1.9	=	Excellent
2.0 to 2.9	=	Good to Acceptable
3.0 to 3.9	=	Poor
4.0 to 5.0	=	Very Poor

We can identify 5 trainers as Excellent, i.e. Trainers 1, 2, 5, 7 and 12. For the purpose of of this paper I would like to identify those teaching methods and characteristics which can be associated with excellent student evaluation:

Trainer no.1

Storytelling

Humour

group interaction was his strongest point

conventional trainer who uses powerpoint presentations(PPP) and lecturing as the main teaching method.

He utilises his experience in practice to make the subject interesting.

He refers to prior knowledge and uses questions to help them recall what they already know.

no communication takes place among students

Wrapping up by summarising and looking forward to the next lesson takes place

He has a CCSF approach.

Trainer no.2

course is well organised. “Module organisation is very important to me”.

individual rapport, and

overall scores were also excellent

He makes use of PPP

includes pictures of farming practices in PPP to illustrate the practical application.

“I expose students to practice”

“my assignments are problem based”

he values learning-by-doing

help students to apply their knowledge

He makes use of video’s to illustrate basic handling practices in commercial sector.

“I would like to make more use of interactive teaching methods”

He has produced a comprehensive study guide

hands out notes for each chapter separately.

He has an ITTF approach.

Trainer no.5

He has a strong personality and is a convincing and eloquent speaker.

Enthusiastic

All of his indicators are positive

Questions to students as a group link with prior knowledge on the subject.

Discussion,

examples, and

scenario's from the commercial sector are used throughout his lecture.

Students interact with trainer but not among themselves.

Wrapping up takes the form of summarising what was done during the lecture.

He has a CCSF approach to training.

Trainer no.7

Very enthusiastic and highly motivated.

Excellent individual rapport with her students.

She is always well prepared for her classes.

Has time available for her students.

Communication is very important to her

I believe that CBL is essential for the future of our college

She has a neutral approach to training but regards both the ITTF and CCSF approach as important.

Trainer no.12

I lecture mostly and always make use of PPP

Tutorials are important for understanding in my subject and corresponds with learning-by-doing

I often use case studies

I require the students to report their results in front of the class

Role-play is often used to illustrate real world situations

I employ various methods of assessment

I use many interactive teaching methods

She has a neutral approach to teaching.

How could trainers support each other in promoting the use of interactive, learning-by-doing and student centred teaching methods?

Many trainers expressed their dissatisfaction with the currents system. “There are no support for improving our teaching standards”, “teaching performance is not evaluated“, “management does not appreciate us”, “management just want us to let all the students pass”, “there are no other trainers that can stand in for my lectures”.

There were however many suggestions about the provision of a support system: ““we need to work together”, “it would be nice if trainers could visit other colleges from time to time”, “we could have an in-house workshop for interactive teaching methods”, “a mentor system for newly appointed trainers would be good”.

When asked about supporting each other the trainers had many ideas and recommendations that could be useful. The recommendations are divided between support for persons entering the training profession and those for already experienced trainers.

New entrants into the training profession:

We usually think of new trainers as newly qualified persons from university or other Higher Education institution, but in reality it could be any person that enters the education profession without prior teaching experience. Although most trainers have teaching qualifications it is still very important to provide support for them during their first year as a trainer. What happened to most of the trainers at the colleges under discussion is that they started out when a previous trainer had left the position or when a new position was created. You had to design your own module from the guidelines that were available and with the knowledge and experience that you have at hand. Usually your first lectures were very tentative and students could see that you were not experienced leading to them taking chances and seeing how far they could go in your class. This could eventually lead you to fall back on the formal lecturing format where students are told to keep quiet and listen to what you are saying. In other words total loss of interaction between trainers and students and definitely no interaction among students while you are teaching!. This leads to a total teacher focused attitude towards teaching. Only later when the trained had gained some experience and teaching confidence would he try to move away from the basic lecturing format into exploring other more interactive teaching methods. This lengthy process could be averted by a trainer support system of mentors that are there to help the new trainers in lesson planning and module development. They could also suggest teaching methods and provide mental support to try new methods that work with students in agriculture.

An in-service training programme should also be instituted for all new trainers. This could include new trainers attending classes of experienced trainers that pride themselves in their success as trainers.

A subject support and discussion group could also be successful to help new trainers in adjusting and contributing to becoming competent trainers.

Further education in training could be provided for all trainers who wish to improve their teaching skills. A postgraduate (honors, masters or PhD) degree in education should be an option for all new and experienced trainers. These degrees are available at the Potchefstroom campus of the University of North West and also at the Pietermaritzburg Campus of the University of KwaZulu-Natal. Agreed, this would need a lot of effort from trainers but it can be done on a part-time basis.

Senior staff (experienced trainers)

How often have I heard the experienced trainers complain about teaching not being a challenge anymore. It would be easy to simply say that they have to keep themselves motivated by finding new challenges and trying new things in teaching, but it is also the

responsibility of management to provide an accommodating environment for trainers to grow into.

Senior trainers should be included in management decisions and they should take on more managerial responsibilities as time goes by. Positions for subject heads should be more than a token position with very limited decision making abilities. Experienced trainers could be appointed as mentors for younger trainers. Trainers with the ability to function as Special Educational Needs Coordinator(SENCO) should be identified to care for students with special educational needs.

How do decision makers see their role in promotion and/or support of interactive, learning-by-doing and student centred teaching methods?

The government of South Africa has identified human resource development as a strategic priority for the country. The response of the Department of Agriculture together with other stakeholders and partners to the call to prioritize human resource development in the sector has been the development of the Agricultural Education and Training (AET) Strategy to address human resource challenges in the agricultural sector.

The development of the AET strategy was a consultative process aimed at ensuring optimal participation by all stakeholders. A National Strategy Formulation Team was established consisting of senior officials from various Provincial Departments of Agriculture and Education, national Departments of Education and Labour, Agricultural Public Entities, Higher Education structures, line function Sectoral Education and Training Authorities (SETA's), the National African Farmers Union (NAFU), AgriSA, the Food and Agriculture Organisation and some international consultants.

This AET Strategy represents the first effort to address agricultural education and training holistically in a manner that engages all role players to develop and maintain an effective and well coordinated AET that is integrated at all levels and responding appropriately to South African Agriculture. The strategy advocates working jointly with other Departments and public entities, for example. the Departments of Labour and Education as well as with the SETA's and the South African Qualification Authority (SAQA) to realize a coordinated and relevant AET system that will address the skills needs of the agriculture sector.

This national strategy for AET stipulates that:

A sound, nationally coordinated AET is necessary for effective agricultural and economic development. The content and approach of AET must be guided by a coherent implementation strategy, the formulation of which has been guided by the relevant post-apartheid democratic imperatives, national policies, legal and strategic framework that include:

- An all-inclusive and transparent AET strategy formulation initiative of 2002,
- The Education White Paper 4 – a programme for the transformation of higher education
- The White Paper on Higher Education, 1997
- Strategies for South African Agriculture and Integrated Rural Development
- The Skills Development Act (Act No. 97 of 1998) and its associated implementation strategy
- South African Qualifications Authority Act, 1995 (Act No. 58 of 1995)

The AET strategy has the following three strategic goals, each of which has a number of strategic objectives of which some are highly relevant for education and training at College level.

Goal 1: Develop and maintain an effective and well-coordinated AET that is integrated at all levels and responds appropriately to South African agriculture.

- Ensure policy and curriculum development is coordinated and harmonized.
- Ensure that AET delivery at provincial level is well coordinated.
- Ensure that AET learning is mobile and transferable from one AET institution to another and articulates with hierarchies of AET qualifications.

- Ensure alignment of AET curricula with urgent challenges facing South African agriculture starting with:
    - Sustainable development and land care
    - Food Security and water harvesting
    - Rural wealth creation

Goal 2: Enhance equitable access and meaningful participation in AET for all South Africans.

- Develop and recommend a systematic plan to identify, prioritize and remove access barriers to AET.
- Improve the image of agriculture as a career and livelihood choice: develop and implement a high- impact public education programme that promotes the image of agriculture, particularly among children and the youth.

Goal 3: Ensure the application of an effective quality assurance of AET at all levels and ensure that AET at all levels is accredited and resourced, with the appropriate number of teachers and trainers with relevant skills.

Considering the impact of this study on national policy developments with regard to Agricultural education and training in South Africa the findings of this study need serious attention.

Within the borders of the above policy outline from the national departments of Agriculture and Education the management of the agricultural colleges support all advancements and improvements in education delivery which includes the use of interactive, learning-by-doing, competence based learning and student centred teaching methods.

Chapter 5

Discussion

Effective teaching definition:

*"Most people would agree that **good teachers** are caring, supportive, concerned about the welfare of students, knowledgeable about their subject matter, able to get along with parents… and genuinely excited about the work they do… Effective teachers are able to help students learn".*

Cruickshank, Jenkins and Metcalf, 2003

From the above definition it is possible to extract the following indicators they identified for "good teaching":

- Caring
- Supportive
- Concerned about welfare of students
- Knowledgeable
- Able to get along with parents (social skills)
- Help students to learn

The indicators identified by the students correspond to the eight evaluative indicators in the SEEQ questionnaire in the following way.

• Knowledgeable trainers	Learning, Breadth and Assignments
• Good organisation of course	Organisation
• Effective and fair assessment	Examinations
• Good teaching abilities	Learning and Group interaction
• Friendly and caring person	Individual rapport
• Experienced trainers	Learning, Breadth and Assignments
• Personal contact	Individual rapport
• Interested in students	Individual rapport
• Passion and commitment to subject	Enthusiasm
• Good communication	Learning and Group interaction

It is clear from the above that the choice of indicators in the SEEQ questionnaire agrees with the indicators as identified by the students. It is however interesting to note that the students emphasised some indicators more than others. "Lecturers should be caring", "caring is most important", "we can talk to our lecturers" and "the relationship is much stronger". It emphasises the "individual rapport" indicator from the SEEQ questionnaire and could also point towards the "enthusiasm" indicator, but we can also see that the other indicators such as "learning" and "organisation" were also identified. The encompassing theme of "caring" is discussed in detail by researchers in tertiary education from the university of Memphis: Susan Thompson and John and Bonnie Greer postulate that all of the other indicators are included within this one indicator i.e. "caring".

Research on the "enthusiasm" of teachers is strongly connected to student success (Bettencourt, Gillet, Gall and Hull, 1983; Cabello and Terrell, 1994).

"A teacher that is excited about the subject being taught and shows it by facial expression, voice inflection, gesture and general movements is more likely to hold the attention of students than one who does not exhibit these behaviours."

Borich, 2007

If we combine all the characteristics from the top five trainers we should theoretically get an image of **the ideal trainer**:

- The trainer uses PPP as a tools to assist with the lecturing process and not as the main focus of the lecture. The typical lecture format:
- Links current topic with prior knowledge.
- Uses a variety of methods to do current topic, i.e. storytelling, case study, tutorial, scenario setting, problem based learning, discussion, questions, pictures, video's, group work, role-play, examples from practice, assignments and learning-by-doing.
- Frequent interaction between trainer and students.
- Wrapping up by summarising and looking forward to the next lecture.
- The trainer is enthusiastic about the subject, highly motivated and accessible to students.
- The trainer is also highly organised and well prepared for each lecture.
- Employs various methods of assessment.
- The approach to teaching could be CCSF, ITTF or neutral/balanced.
- All information discussed are linked with practice and the real agricultural/farming situation.
- Trainer draws from experience to make the subject interesting and applicable.

In many institutions, the instruments used to obtain student feedback have been constructed and developed in-house and may never have been subjected to any kind of external scrutiny. It is difficult to compare trainers from different colleges if the SET's are not exactly the same. It is however still possible to compare different trainers within the same college with each other, and also in terms of the different indicators. The SEEQ was able to identify those trainers who were excellent as well as those who need improvement. With a possible application at all agricultural colleges it would be possible to accurately compare and evaluate between college trainer performance.

There are however some reservations about external factors influencing the accuracy of the SET's. Marsh (1987) acknowledged in particular that more positive SET's might arise

from the students satisfaction at receiving higher grades (the *grading satisfaction hypothesis*) or else from other uncontrolled characteristics of the student population.

The test-retest reliability of students' evaluations is high, even when there is an extended period between the two evaluations. The interrater reliability of the average ratings given by groups of students is also high, provided that the average is based on 10 or more students. There is a high correlation between the ratings produced by students taking *different* course units taught by the *same* teacher, but little or no relationship between the ratings given by students taking the *same* course unit taught by *different* teachers. This suggests that students' evaluations are a function of the person teaching the course unit rather than the particular unit being taught.

Evaluations of the same teachers given by successive cohorts of students are highly stable over time. Indeed, Marsh and Hocevar (1991b) found no systematic changes in students' ratings of 195 teachers over a 13-year period. Although this demonstrates the stability of the students' ratings, it also implies that the performance of the teachers was not improving with experience.

There is better evidence that SET's are correlated with ratings of specific aspects of teaching by trained observers (see Murray, 1983). In principle, the validity of students' evaluations might be demonstrated by finding correlations between SET's and academic performance. However, the demands and the assessment criteria of different course units may vary, and so students' grades or examination marks cannot be taken as a simple measure of teaching effectiveness.

The relationship between course/module evaluation and students approach to study: It has been shown that students who evaluate their courses/modules more positively are more likely to adopt a deep approach to learning (Lawless and Richardson, 2002).

The results showed no correlation between students evaluation of teaching and either ITTF, CCSF of neutral/balanced approach to teaching. From the top five trainers, two were CCSF, one ITTF and two were neutral/balanced with respect to their Approach to Teaching.

Trainers showed a tendency to conform to the classical lecturing style but have all incorporated interactive teaching methods into their teaching to a more or lesser extent. From the image we have of an "ideal trainer" it is possible to suggest what a trainer should do but it is course unreasonable to think that all trainers will be able to use all of the characteristics. It is thus suggested that a trainer examines the characteristics of an "ideal trainer" and takes what is possible to improve him/her-self. PPP were used by most trainers but all did not succeed in using it successfully. It should only be used as one of the tools available to trainers for "making learning happen". All "tools" should thus be used when and where it is most applicable, and suited to the "training style" of that particular trainer.

Continued exposure to new ideas and challenges via courses, training workshops or formal studies motivates and stimulates trainers to perform at their peak.

Chapter 6

Conclusion and Recommendations

1. An action plan for learning and teaching should be drawn up to assess, initiate and monitor learning and teaching improvement at all agricultural colleges in SA.
2. SEEQ's should be standardized throughout all agricultural colleges in SA. The feedback can be obtained by means of a standard questionnaire, the responses can be automatically scanned, and a descriptive summary of the responses can be returned to the relevant trainer and, if appropriate, the trainers head of department. The process is relatively swift, simple and convenient for both students and trainers and will be accepted as a matter of routine. Because cross-cultural research tended to confirm the factor structure of the SEEQ, Marsh and Roche (1994) argued that it was especially appropriate for the increasingly multicultural student population attending Australian universities. For this same reason the SEEQ questionnaire is most applicable to South African Agricultural Colleges.
3. Trainers performance should be measured accordingly. Other equivalent evaluations, i.e. peer review and peer observation, external panels or evaluation by academic head, should be done to provide a balanced measurement of trainer performance (Wood and Harding, 2007). Trainers promotions and salary supplementation, i.e. performance bonuses should be influenced by this.
4. Further training of trainers should take place, especially the trainers from PCA who have not attended the advanced teaching course in interactive teaching methods presented by specialist trainers from an International organisation.
5. Continue on the path of competence based education with the development and implementation of a CBL based curriculum. Request continued support and assistance from the national and/or provincial departments of agriculture. Build on the relationship established with educational organisations, with expertise in CBL, from the Netherlands.
6. All trainers should be given the opportunity and support from the management to further their educational training, i.e. Honors, Masters or PhD studies in SA or international.
7. It should be communicated to all trainers what the way forward for the colleges are, and what will be expected of them in the future. The changing agricultural environment provides enough challenges for the agricultural colleges as a whole but the trainers have to be taken along the path of change by further training and development.

Chapter 7

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Chapter 8

Annexures

Student Evaluation of Educational Quality (SEEQ) – LONG VERSION

Please name the subject/course/context of your response: …….

Please read each question very carefully. Make sure you understand what is being asked. Use the following scale for the first 29 questions and circle the number that is closest to your rating for that item:

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1	2	3	4	5

Questions:	Strongly Agree				Strongly Disagree
LEARNING:					
1. I have found the course intellectually challenging and stimulating.	1	2	3	4	5
2. I have learned something which I consider valuable.	1	2	3	4	5
3. My interest in the subject has increased as a consequence of this course.	1	2	3	4	5
4. I have learned and understood the subject materials of this course.	1	2	3	4	5
ENTHUSIASM:					
5. The trainer was enthusiastic about teaching the course.	1	2	3	4	5
6. The trainer was dynamic and energetic in conducting the course.	1	2	3	4	5
7. The trainer enhanced presentations with the use of humour.	1	2	3	4	5
8. The trainer style of presentation held my interest during class.	1	2	3	4	5
ORGANISATION:					
9. The trainer explanations were clear.	1	2	3	4	5
10. Course materials were well prepared and carefully explained.	1	2	3	4	5
11. Proposed objectives agreed with those actually taught so I knew where the course was going.	1	2	3	4	5
12. The trainer gave lectures that facilitated taking notes.	1	2	3	4	5
GROUP INTERACTION:					
13. Students were encouraged to participate in class discussions.	1	2	3	4	5
14. Students were invited to share their ideas and knowledge.	1	2	3	4	5
15. Students were encouraged to ask questions and were given meaningful answers.	1	2	3	4	5
16. Students were encouraged to express their own ideas and/or question the trainer.	1	2	3	4	5

INDIVIDUAL RAPPORT:	
17. The trainer was friendly towards individual students.	1 2 3 4 5
18. The trainer made students feel welcome in seeking help/advice in or outside of class.	1 2 3 4 5
19. The trainer had a genuine interest in individual students.	1 2 3 4 5
20. The trainer was adequately accessible to students during office hours or after class.	1 2 3 4 5
BREADTH:	
21. The trainer contrasted the implications of various theories.	1 2 3 4 5
22. The trainer presented the background or origin of ideas/concepts developed in class.	1 2 3 4 5
23. The trainer presented points of view other than his/her own when appropriate.	1 2 3 4 5
24. The trainer adequately discussed current developments in the field.	1 2 3 4 5
EXAMINATIONS:	
25. Feedback on examinations/graded materials was valuable.	1 2 3 4 5
26. Methods of evaluating student work were fair and appropriate.	1 2 3 4 5
27. Examinations/graded materials tested course content as emphasized by the trainer.	1 2 3 4 5
ASSIGNMENTS:	
28. Required readings/texts were valuable.	1 2 3 4 5
29. Readings, homework, etc. contributed to appreciation and understanding of subject.	1 2 3 4 5

Circle the number that is closest to your rating.

OVERALL:
30. Compared with other courses I have had at …….. College of Agric., I would say this course is:
1. Very Good 2. Good 3. Average 4. Poor 5. Very Poor = 5
31. Compared with other instructors I have had at …….. College of Agric., I would say this trainer is:
1. Very Good 2. Good 3. Average 4. Poor 5. Very Poor
32. As an overall rating, I would say this trainer is:
1. Very Good 2. Good 3. Average 4. Poor 5. Very Poor
33. Course difficulty, relative to other courses, was:
1. Very easy 2. Easy 3. Average 4. Difficult 5. Very Difficult
34. Course workload, relative to other courses was:
1. Very light 2. Light 3. Average 4. Heavy 5. Very heavy
35. Course pace was:
1. Too slow 2. Slow 3. About right 4. Fast 5. Too fast
36. Hours/week required outside of class:
1. 0 to 2 2. 2 to 5 3. 5 to 7 4. 7 to 12 5. over 12
37. Level of interest in the subject prior to this course:
1. Very high 2. High 3. Medium 4. Low 5. Very low

Thank you

APPROACHES TO TEACHING INVENTORY 22

This inventory is designed to explore a dimension of the way that academics go about teaching in a specific context or subject or course. This may mean that your responses to these items in one context may be different to the responses you might make on your teaching in other subjects/course/contexts. For this reason I ask you to describe your context.

Please name the subject/course/context of your response: …….

For each item please circle one of the numbers (1-5). The numbers stand for the following responses:
1 - this item was **only rarely or never** true for me in this subject.
2 - this item was **sometimes** true for me in this subject.
3 - this item was true for me **about half the time** in this subject.
4 - this item was **frequently** true for me in this subject.
5 - this item was **almost always or always** true for me in this subject.

Please answer each item. Do not spend a long time on each: your first reaction is probably the best one.

Questions:	Only rarely				Almost always
1. In this subject students should focus their study on what I provide them.	1	2	3	4	5
2. It is important that this subject should be completely described in terms of specific objectives that relate to formal assessment items.	1	2	3	4	5
3. In my interactions with students in this subject I try to develop a conversation with them about the topics we are studying.	1	2	3	4	5
4. It is important to present a lot of facts to students so that they know what they have to learn for this subject.	1	2	3	4	5
5. I set aside some teaching time so that the students can discuss, among themselves, key concepts and ideas in this subject.	1	2	3	4	5
6. In this subject I concentrate on covering the information that might be available from key texts and readings.	1	2	3	4	5
7. I encourage students to restructure their existing knowledge in terms of the new way of thinking about the subject that they will develop.	1	2	3	4	5
8. In teaching sessions for this subject, I deliberately provoke debate and discussion.	1	2	3	4	5
9. I structure my teaching in this subject to help students to pass the formal assessment items.	1	2	3	4	5
10. I think an important reason for running teaching sessions in this subject is to give students a good set of notes.	1	2	3	4	5
11. In this subject, I provide the students with the information they will need to pass the formal assessments.	1	2	3	4	5
12. I should know the answers to any questions that students may put to me during this subject.	1	2	3	4	5
13. I make available opportunities for students in this subject to discuss their changing understanding of the subject.	1	2	3	4	5
14. It is better for students in this subject to generate their own notes rather than copy mine.	1	2	3	4	5
15. A lot of teaching time in this subject should be used to question students' ideas.	1	2	3	4	5
16. In this subject my teaching focuses on the good presentation of information to students.	1	2	3	4	5
17. I see teaching as helping students develop new ways of thinking in this subject.	1	2	3	4	5
18. In teaching this subject it is important for me to monitor students' changed understanding of the subject matter.	1	2	3	4	5
19. My teaching in this subject focuses on delivering what I know to the students.	1	2	3	4	5
20. Teaching in this subject should help students question their own understanding of the subject matter.	1	2	3	4	5
21. Teaching in this subject should include helping students find their own learning resources.	1	2	3	4	5
22. I present material to enable students to build up an information base in this subject.	1	2	3	4	5

Thank you

The following information about Agriculture in South Africa and the Agricultural Colleges are provided to make it possible to understand the environment in which the education and training system has to function at present.

The South African Agricultural sector

The main strategic goal of the agricultural sector is to generate equitable access and participation in a globally competitive, profitable and sustainable agriculture sector contributing to a better life for all. Accredited training and education is central to this transformation process. Recently a well defined strategy on education and training for agriculture, together with a properly structured implementation plan has been developed outlining also the need to improve existing service delivery systems and to train competent extension staff. The South African Land Redistribution for Agricultural Development (LRAD) has as its main aim to facilitate access by the emerging black farmers to farming opportunities with a target of transferring 30% of the agricultural land to them. In terms of acreage this translates into at least 37 million hectares of land, and at least 2 – 3 million black South Africans. Training officers must render a service to these new entrants that are often farming in groups, have limited farming experience, knowledge/skills (group dynamics, leadership skills etc) and have limited understanding of the total agricultural chain. Training and education has been left to provincial departments to enable them be responsive to local social, economic and ecological conditions. Advisory and subject advisory committees exist. This enables key players to play their role effectively and provide a general framework within which the training and education can be provided and further developed to support the emerging farmers. A shortage of trained extension staff is experienced in numerous Provincial Departments of Agriculture. In some regions only 10% of posts are currently filled. Training and education at Provincial level is organized around district managers. They experience a severe shortage of staff.

Extension services are also required by the local municipalities as several intensive farming projects are initiated and driven by local councils. Some projects are also driven by NGO's and they also experience a need for well trained extension officers. For example in the Mpumalanga Province there are three Regional managers, one for each district. Staffing levels at the moment are at 16 officers only. There are 17 vacant posts. In addition, continuous upgrading and training is also necessary for the existing staff. In the North West Province there are four regional managers with a number of Agricultural Development Centres (ADC's) serving the different districts. The existing extension officers lack extension training and are mostly employed as extension technicians. These officers need training in extension so that they can also develop a career path as extension officers.

Cedara College of Agriculture

Legal Status: Public Training Institution (KZN Department of Agriculture and Environmental Affairs)

Number of academic and administrative Staff:

Administration	:	4
Technical (Farm)	:	4
Intern (12 months)	:	3 (2 vacant)
Lecturing	:	13 (2 vacant)

Number of Students:

Higher Certificate	:	142
Diploma	:	29
Annual Budget	**:**	R 12 million
Website	**:**	http://agriculture.kzntl.gov.za

Mission and strategy of the organization

To offer academic and practical training in various aspects of agriculture by means of training courses, a two-year Higher Certificate and a three-year Diploma in Agriculture at the Higher Education level.

Specific role in the country/sector

Cedara College trains agriculturalists at the Higher Education (HE) level. The current enrolment is approximately 175 full-time students in both the Higher Certificate and Diploma in Agriculture. Cedara College provides graduates, who have a solid background in both theoretical and practical agriculture, to agriculture in KZN and South Africa. The Agricultural Colleges in KZN (Cedara and OSCA) are the only institutions offering agriculture at the HE level that provide a qualification that is practically based. As such Cedara College has an important role to perform in a number of important national and provincial strategies:

- Provide new commercial farmers (esp. black farmers) for the agricultural industry,
- Provide mentors for new farmer settlements,
- Provide entrepreneurs in the agricultural field, and
- Provide agribusiness / agriculture with competent graduates

Main activities

The main activity of Cedara College is to train agriculturalists at the HE level to take up positions or become entrepreneurs in the agricultural field. The College also assists communities (particularly schools) in developing agriculture. The College is also exploring the possibilities of expanding into the Further Education and Training (FET) sector.

Main elements of the strategic plan

- Cedara College of Agriculture will foster a learner-centered environment to serve its diverse students, staff and community through continual identification and assessment of learning needs for the 21st century.
- Cedara College will act with an understanding of and respect for the College as a dynamic, complex institution serving the needs of its diverse communities.
- The College will recruit quality staff who will support the effectiveness and good reputation of the college.
- Cedara College will implement continuous improvement processes that provide meaningful feedback to achieve excellence.
- Cedara College will diversify and increase resources to provide quality programs and services, facilities, technology, and human resources to support its community of learners.

- Cedara College will create and nurture partnerships with other stakeholders in and outside the Province and throughout the communities we serve to maximize cultural, economic, and political strength.
- Cedara College will develop its farm to better suite the practical and theoretical requirements of its students and to generate income that would promote entrepreneurship and student financial needs.

Management structure of Cedara College

Cedara College is headed by the Principal (Deputy Manager level), supported by two Vice Principals (Academic & Registrar). The Principal is also supported by three Heads of Departments (Crop Production, Animal Production and Farm Management and Practice). These are unofficial posts and are senior lecturers in the College who perform additional duties, especially related to quality assurance.

The College is also supported by three administrative staff.

Currently the Principal reports to the Acting General Manager (Research and Technology

Development) who reports the Chief of Operations. The KZN Department of Agriculture and Environmental Affairs is currently, however, involved in restructuring training in the Department.

Institutional analysis: Strengths and weaknesses

Strengths

- Academic standards and good track record *
- High students employment rate *
- College facilities for training *
- Staff quality *
- Support by the DAEA
- Accreditation

Weaknesses

- Inability to attract quality students *
- Student weakness in numeracy *
- Language skills (English as a second language) *
- Thinking skills *
- Lack of student financial aid
- Lack of accommodation – would restrict increase in student numbers

Opportunities

- Generation of farm profit by better utilization of the farm facilities *
- Development of student entrepreneurial skills *
- Provide mentors for New Farmer Settlements *

Threats

- Uncertain future of Agricultural Colleges

- Agriculture on downward spiral (decrease in student population) *
- High staff turn over
- Potential to lower standards *
- Low levels of skills (numeracy, literacy and communication) and thinking-application skills of entrants *

* **W**eaknesses and Threats will be addressed, and Strengths and Opportunities will be supported and maintained by this project.

Resources

Cedara College has the necessary infrastructure to deliver its training requirements to its students. The College currently has nine lecture rooms. A new complex was completed in 2007. This contains six lecture rooms, a fully equipped laboratory and a workshop. This has increased the potential capacity of the College enormously. The College also has the practical facilities to deliver on its mandate. The College Farm (approx. 300 ha) consists of 100 cow beef herd, 200 ewe sheep flock, equine stud, poultry and broiler units, a small piggery and the Department has a dairy. The College also has land available for an orchard, vegetables, agronomic crop and pastures. The College is also investing in a tunnel and nursery of it own, but currently use can be made of Departmental structures.

Cedara College currently employs 51 staff, including 13 lecturers and 4 administrative staff. All staff are highly qualified in their particular field.

The budget is managed under the prescripts of the Public Finance Management Act (PFMA) and annual reporting is done to the Provincial Legislature.

Potchefstroom College of Agriculture

The Potchefstroom College of Agriculture(PCA) is situated in the North West Province and borders the grassland and savanna biomes, and started out as an English agricultural high school in 1909. http://www.plantzafrica.com/frames/vegfram.htm

Full legal name: Department of Agriculture, Conservation, Environment and Tourism (on behalf of the Potchefstroom College of Agriculture (PCA))

Acronym (if applicable): PCA

Legal status: Public Training Institution (Dept. Agriculture)

Number of academic and administrative staff:

Management	:	6
Administration	:	4
Lecturing	:	20

Number of students

Pre-Graduate	:	157
Annual Budget	**:**	R 2.7 Million (Salaries excluded)

Website: http://www.nwpg.gov.za/index.asp

Mission and strategy of the organisation

The Potchefstroom college of agriculture, as a division of the department of agriculture, environment, conservation and tourism, has as it's aim development and service delivery of excellent quality by:

- Continually keeping abreast with the latest innovative development in the agricultural industry,
- Innovatively meeting the changing and challenging demands of the agricultural industry and the training sector,
- Training those in the agricultural industry in such a manner, thus enabling them to make a positive contribution to sustainable economic growth within Southern Africa and more specifically that of the agricultural industry,
- Continually meeting the requirements and needs of further skills development and transference of knowledge as required by the fast changing environment in Southern Africa, and
- Continually and sensitively paying attention to the needs of the clients of the college and, thereby, relevant and excellent service.

Specific role in the country/sector

The PCA started as a college in 1909. The institution changed from an Agricultural School to a College in 1935. The main focus of training has been on the training of agricultural practitioners in the Highveld region of South Africa. This region includes the Northern Free state part of the Province, North West Province, Highveld areas of Mpumalanga- and Limpopo Province as well as Gauteng. Training can be provided to about 320 full time students enrolled for the Higher Certificate in Agriculture and the Diploma in Agriculture (Higher Education), short courses are also presented about 200 learners per year by the Further Education and Training division(FET).

Main activities

The main activities of PCA are to provide training in agriculture for prospective agricultural practitioners, to provide training to employees in the agricultural sector and train current agricultural practitioners to enhance human resource development. The formal programme of the college includes the Higher Certificate and Diploma in Agriculture which is presented on HE level. The FET training is mostly done in skills training and short courses. Most of the short courses are designed to cover the specific needs identified by the clients (farmers, especially resource poor farmers and developing farmers) and the extension staff.

The introduction of learnerships are planned to enable the College to also train farm workers to enhance their development and productivity.

Relationship with the Department of Agriculture, Conservation, Environment and Tourism (DACET)

PCA is managed by the programme manager under Scientific and Technical Support Services (STSS). This institution is one of the important delivery arms of the Department. Further development of this institution will greatly benefit the Department as well as the Agricultural industry in this area. The dedication and hard work of the staff in this institution have earned the College a place as a respected training institution for prospective farmers and agricultural practitioners.

Strategic plan

Management structure of PCA

The PCA is headed by a Principal (Manager Level) supported by a management team consisting of a Vice – Principal (Divisional Manager), Registrar, Academic Manager, Control Industrial Technician and Informal/non formal Training Manager (Sectional Manager Level). The College is structured to have the four subject areas as

Departments. These departments are: Animal Production, Plant Production, Agricultural Management and Agricultural Engineering. An agricultural extension(communication for innovation) department will be developed.

Institutional analysis: strengths and weaknesses

Strengths

- The PCA is the only agricultural college that teaches Higher Education (HE) in the North West Province specialising in agricultural training. The North West University also provides training in agriculture but their target group is more focused towards research training.
- PCA is funded by the North West Provincial Government on a running three year cycle (Medium Term Expenditure Framework).
- Infrastructure of the College is modern and well planned.
- Training of developing sector is an important priority.
- Number of applications from prospective students exceeds the supply by 75%.
- The current staff is well trained and a big portion have qualifications in education.
- Skills programmes are currently being developed and introduced by PCA

Strong points

- Good training Facilities
- Qualified and experienced staff
- Programmes accredited by Higher Education Quality Committee (HEQC)
- Programmes acknowledged by the industry.
- High credibility of the institution
- Well managed

Weak points

- Shortage of teaching staff for new programmes
- Limited subject offerings
- Lack of funding for expansion of training offered

Resources

The PCA has the necessary physical infrastructure to conduct training of students on different levels. Lecturing facilities comprises of 9 lecturing halls accommodating 20 to 200 students respectively. Hostel accommodation on campus can be provided for 220 students. Practical facilities consist of a horticulture section (with tunnels and vineyards for table grape production as well as an orchard), engineering section (workshops for mechanics, welding and building), sheep and wool section (200 ewes), dairy section (50 cows in lactation), AI section with 60 cows and 40 hectares of irrigated land. Students use the beef cattle herds of the Department for practical training. The College employs a staff component of 95 including 20 lecturing staff 9 technical support staff and 6 administrative support staff. It is envisaged to increase the lecturing staff to 23 and the technical support staff to 14 by 2010. The PCA currently manages a budget of R 2.7 million for the operational needs of the institution the total budget amounts to R 11.2 million for the PCA. The budget is managed under the prescripts of the Public Finance Management Act (PFMA) and annual reporting is done to the Provincial Legislature.