

**GOALS, ATTRIBUTIONS AND SELF-EFFICACY AS RELATED TO COURSE  
CHOICE AND ACADEMIC ACHIEVEMENT OF FIRST-YEAR UNIVERSITY  
STUDENTS**

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## OPSOMMING

### **DIE VERBAND TUSSEN DOELWITORIËNTASIE, ATTRIBUSIES, SELFDOELTREFFENDHEID, VAKKEUSE EN AKADEMIESE PRESTASIE**

Die doel met hierdie studie was om te bepaal: (i) of verbande bestaan tussen doelwitverwagtings, selfdoeltreffendheid, attribusies en attribusie-dimensies, (ii) of die motiveringspatrone, en (iii) attribusiestyle van studente verskil as die konseptuele vlak van die kursus verskil, en (iv) of attribusiestyl en selfdoeltreffendheid die akademiese prestasie van studente in vakke wat verskil in konseptuele vlak, verskillend beïnvloed.

'n Literatuurstudie is onderneem om te bepaal wat die aard van doelwitoriëntasies, attribusies en selfdoeltreffendheid is, en watter invloed hierdie faktore op leer en akademiese prestasie uitoefen. Daar is vasgestel dat die benadering tot leer en motivering, enige invloed wat die veranderlikes mag hê, bepaal. 'n Student met 'n produkeoriënteerde benadering konsentreer op die leer van inhoud en evalueer die effektiwiteit van sy leergedrag aan die hand van akademiese prestasie en sosiale goedkeuring. Met 'n prosesgeoriënteerde benadering, wat meer bevorderlik is vir leer, ontwikkel die student die metakognitiewe vaardighede wat hy benodig om sy leergedrag self te evalueer. 'n Christelike evaluering het gelei tot die gevolgtrekking dat 'n prosesgeoriënteerde benadering tot motivering aanvaarbaar is, mits selfevaluering op 'n Christelike antropologie gegrond is.

Die lokus, stabiliteit en beheer van attribusies (d.i. attribusiestyl of doelwitoriëntasie) beïnvloed motivering meer as die keuse van attribusies. Die vlak van selfdoeltreffendheid medieer egter die invloed wat doelwitoriëntasie op kursusse en akademiese prestasie uitoefen. Studente met 'n hoë vlak van selfdoeltreffendheid, kies uitdagende kursusse en volhard ongeag of hulle doelwitoriëntasie leergerig of prestasiegerig is. Studente met 'n lae selfdoeltreffendheidsvlak en 'n prestasiegerigte doelwitoriëntasie, kies gemiddeld-tot-maklike kursusse in 'n poging om ongunstige eksterne evaluering en 'n verlies aan selfwaarde te vermy. 'n Leergerigte doelwitoriëntasie is meer positief as 'n prestasiegerigte doelwitoriëntasie aangesien bevoegdheid beklemtoon word, en nie akademiese prestasie nie.

Die populasie vir hierdie ondersoek het bestaan uit Afrikaanssprekende universiteitstudente wat eertejaarskursusse in geskiedenis en menslike bewegingskunde (kursusse met 'n lae konseptuele vlak), en wiskunde en

## SYNOPSIS

### GOALS, ATTRIBUTIONS AND SELF-EFFICACY AS RELATED TO COURSE CHOICE AND ACADEMIC ACHIEVEMENT

This study was aimed at determining: (i) relationships among goal expectancy, self-efficacy, attributions and attributional dimensions, (ii) whether motivational patterns, and (iii) attributional styles, differ in accordance with conceptual levels of courses, and (iv) whether attributional style and self-efficacy influence academic achievement in courses differing in conceptual level.

A literature study was undertaken to examine the nature of goals, attributions and self-efficacy, and their influence on learning and academic achievement. It was found that the approach to learning and motivation determines whatever influence the variables have. With a product-oriented approach students concentrate on learning content, and evaluate their performance according to academic achievement and social approval. A process-oriented approach, which is more conducive to learning, develops metacognitive skills, necessary for self-evaluation of learning performance. Through a Christian evaluation, the conclusion was reached that the process-oriented approach to motivation was acceptable, given that self-evaluation was based on a Christian anthropology.

Perceptions of the locus, stability and control of attributions (i.e. attributional style or goal orientation) were found to influence motivation more than choice of attribution. Level of self-efficacy, however, mediates the influence of goal orientation on course type and academic achievement. Students with high self-efficacy choose challenging courses and persevere, whether they have learning- or performance orientations. Students with low self-efficacy and performance orientations choose average-to-easy courses, to avoid unfavourable external evaluation and loss of self-esteem. A learning orientation is more positive than a performance orientation, as competence, and not academic achievement or social approval, is emphasised.

With a process-oriented approach students thus learn cognitive and metacognitive skills necessary for self-evaluation, and develop a learning orientation. As perceptions of self-efficacy are based on competence, students become motivated to learn and choose challenging courses.

Students enrolled for first-year courses in history and physical education (less conceptual courses), and mathematics and private law (highly conceptual

# CHAPTER 1

## STATEMENT OF THE PROBLEM AND CLARIFICATION OF CONCEPTS

### 1.1. INTRODUCTION AND STATEMENT OF THE PROBLEM

The Republic of South Africa is at present experiencing a political, social and economic crisis which has major implications for tertiary education. In a report by the Committee for Economic Affairs (1989:5) it is stated that South Africa will have to lower its production costs of commodities and services, including university education, and heighten its standards of productivity to stay internationally competitive. Universities have gone a long way in rationalizing the numbers of academic personnel and cost-ineffective courses, and can no longer afford to enroll or accommodate students, who are not motivated to and capable of mastering the courses for which they have enrolled.

University enrollment is primarily regulated by prior school achievement. Despite the fact that enrollment criteria are constantly heightened, large numbers of students still fail to master courses in the minimum specified time. It is also not unusual for a first-year university student to achieve poorly at tertiary level in a specific course, despite average to above-average achievement in the same type of course at school, and an average to above-average intelligence.

In view of the socio-economic climate and the poor performance of some first-year students, it is necessary to identify which variables, apart from prior achievement, influence the choice of courses and the academic achievement of first-year students.

World-wide there is currently much interest in post-secondary educational reform, which has resulted in research aimed at identifying and improving the cognitive and motivational skills and strategies of students through a more process-oriented approach to learning and instruction (Pintrich, 1988:65; Bandura, 1986; Zimmerman, 1985; Weiner, 1985). Motivation has been found to be one of the variables influencing, not only course choice (Feather, 1988) and academic achievement at tertiary level (Chacko, 1989), but also the discrepancy

preparation for classes. In turn, self-monitoring of study strategies was found to be influenced by students' motivation. According to Chacko (1989) this model explained 46% of the variance in academic achievement. Van Overwalle (1989) did research on the structure of causal attributions (a motivational variable) for examination performance of first-year students enrolled for courses in different departments. He reported that no differences occurred in how the students of the different courses structured the most salient attributions into dimensions of locus, stability and control.

Much research has been done to identify which variables influence the academic achievement of first-year university students in the Republic of South Africa, inter alia, language proficiency (Court, 1989), self-concept (Sonn, 1987), family influences (Coetzee, 1984) biographical variables (Theron, 1989), and self-maintaining strategies (Van der Walt, 1981). The only research pertaining to the motivation of first-year students that could be found, was that of Botha (1989), Naudé, Van Aarde and Laubscher (1989) and Du Plessis (1987). Botha (1989) evaluated Herman's Achievement Motivation Test as a measuring instrument for test anxiety and found it to be reliable. Du Plessis's (1987) research was aimed at determining the effectiveness of a comprehensive study-counselling programme, which included achievement motivation as a variable, on the study habits of first-year engineering students. Naudé et al. (1989) found that English-speaking students achieved higher marks than Afrikaans-speaking students. They attributed these results to cultural differences, more creative thought and better proficiency in the second language, which influenced achievement motivation.

No research literature could be found on the identification of the relationships between: (i) attributions, attributional dimensions (i.e. attributional style which relates to goal orientation), self-efficacy and goal expectancy, (ii) motivational pattern and course type, as differentiated by course content, (iii) attributional style and course type, or (iv) self-efficacy and attributional style and the academic achievement of first-year university students. Since these limitations were identified, it was found necessary to aim research at these aspects of motivation.

*Self-efficacy* refers to the student's subjective evaluation of how efficacious he is to perform a certain learning task, and is influenced by his goal-orientation and attributions (Bandura, 1982:122). A performance-oriented student, who attributes results mostly to extrinsic variables, evaluates his self-efficacy according to external criteria, such as the achievement of others or external evaluation. A student with a learning orientation usually attributes results to intrinsic variables and evaluates his self-efficacy by judging his performance in context of his competencies (Dweck, 1986:1040-1041). The stability and control dimensions of attributions affect self-efficacy most (Bandura, 1982; Dweck, 1986; Weiner, 1985). Thus there is a relationship between attributions, attributional style, goals (specified as goal expectancy) and self-efficacy, of which attributional style and self-efficacy influence academic achievement.

In the context of this study *motivational pattern* refers to the relationship between attributions, attributional style and self-efficacy. A student with an adaptive motivational pattern is intrinsically motivated to master the cognitive and metacognitive skills (i.e. planning, controlling and evaluating his own comprehension and progress), necessary for effective learning. A student with a maladaptive motivational pattern is extrinsically motivated to memorise content and thereby gain a good grade or the approval of significant others (Dweck, 1986). As a student with a maladaptive motivational pattern does not have the necessary cognitive and metacognitive skills to evaluate the competencies that he gains from performing learning tasks, he concentrates on his grade as an external criterium of success.

Since the attention of a student with a maladaptive motivational pattern is directed at content, he often pursues courses which he perceives to be content-relevant and of an easy-to-average difficulty level, such as history or physical education. Such a student will only choose a challenging learning task (and course) if he is certain of gaining a high grade. A student whose learning is directed at mastering the cognitive skills that would enable him to understand, integrate and use new knowledge in a functional manner, is more prone to choose challenging course such as mathematics or private law (Dweck, 1986:1042). Dweck (1986) found that students with adaptive motivational patterns not only chose more challenging learning tasks, regardless of their self-perceived ability, but also showed more persistence in mastering the tasks. As motivational patterns develop gradually and are already established and fixed by the time the student reaches the secondary and tertiary levels (Mischel &

teach students strategies to change their motivational patterns if they are maladaptive.

In the second article (cf. Chapter 3) motivational patterns, consisting of the interrelationship between the student's goal orientation, attributions and self-efficacy, are discussed in the context of research findings.

The theoretical nature of the first two articles is necessitated by the need for a strong theoretical model of motivation, in teaching and learning context, on which to base assessment programs that are relevant to instructional improvement (Pintrich, 1988:65). As many university students achieve below their potential and are poorly motivated, lecturers need to become aware of theoretical models that have the capacity to explain learning behaviour in a manner that will enable both the lecturer and the student to remedy the behaviour. Both these articles therefore conclude with educational implications.

The aim of the third article (cf. Chapter 4) is to assess the acceptability of a process-oriented motivational approach to Christian education, since such an assessment has not been done before. This article, therefore, places the process-oriented motivational approach in an anthropological perspective, as all behaviour, including learning and teaching, is directed by anthropology. In this article the process-oriented motivational approach is, by necessity, described again. The emphasis is, however, now on the concepts of self-knowledge and self-control as determined by self-evaluation. These concepts are also discussed from a Christian viewpoint. The process-oriented motivational approach is evaluated from a Christian perspective and conclusions concerning its acceptability to Christian education are drawn.

In the fourth article (cf. Chapter 5) the relationships between, attributions, attributional dimensions, goal expectancy and self-efficacy (the components of the expectancy-value theory) are identified by means of empirical research. The relationship between motivational pattern and course type is also analysed. The last article (cf. Chapter 6) deals with the empirical research about the relationship between attributional choice and attributional style, and the influence of attributional style and self-efficacy on the academic achievement of students enrolled for different types of courses at first-year university level. In chapter 7 a summary of the literature study and the empirical research is given, conclusions are drawn and the limitations of the study are discussed. The chapter concludes with recommendations for future research.

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A process-oriented approach to learning focuses on the motivational and cognitive processes that the student uses to instigate and sustain, understand and use new knowledge and skills (Cleaver, 1988:270; Malloch, 1987:15). Instruction is aimed at guiding the student to master the cognitive, metacognitive and motivational skills and strategies with which he can initiate and sustain learning in a responsible and self-regulated manner (Pintrich & De Groot, 1990; Zimmerman, 1985).

Since learning is a composite construct, it will be described first, after which the process-oriented and product-oriented approaches to learning and motivation will be discussed. The characteristics of a process-oriented student will be described next, followed by the educational implications of a process-oriented approach to learning.

## 2.2 DEFINITION AND DESCRIPTION OF LEARNING

Learning involves both the acquisition and modification not only of knowledge, but also skills, strategies, beliefs and behaviours at different levels of complexity (Schunk, 1991:1). As learning is so complex in nature, no definition of learning is uniformly acceptable to all educationists. Many definitions, however, employ common criteria to define learning. The first of these criteria is that learning involves behavioural change, or the capacity to behave differently. The student thus develops new behaviours or modifies existing ones through learning. The second criterion is that the behavioural change occurs through practice or experience, and is not genetically determined. The third criterion is that the behavioural change endures over time, which means that the change is not temporary, but not necessarily permanent either (Schunk, 1991:1-2).

In line with these criteria Gagné (1985:2) defines learning as "a change in human disposition or capability, which persists over a period of time, and which is not simply ascribable to processes of growth". Shuell (1986:111) defines learning as "an enduring change in behavior, or in the capacity to behave in a given fashion, which results from practice or other forms of experience". According to Schmeck (1988:5) the quality of the student's thoughts determines the quality of the learning outcome which, according to Gagné (1985:xiii), can be newly acquired or changed values, attitudes, capabilities, intellectual or motor skills, cognitive strategies or verbal knowledge.

## 2.3 APPROACHES TO LEARNING

### 2.3.1 Basis for differentiating between learning approaches

Mayer (1989:45) classifies instruction, the learning task, student characteristics and learning processes as process variables. Learning outcomes and learner performance form the product variables that are influenced and determined by the process variables. According to Marton (1988:53) emphasis on ready-made knowledge (a product variable) typifies product-oriented learning approaches, while emphasis on mental operations (a process variable) typifies process-oriented learning approaches.

The student's belief about the relative importance of the processes and products of learning, relates to his perception of the goal of learning and to the teacher's approach to instruction (Winne, 1985:797). When the goal of learning is to gain, remember and reproduce *knowledge*, learning is directed at the outcomes and products of learning. When the goal is to *acquire cognitive strategies* with which to gain, remember and use knowledge and skills, learning is viewed in terms of the processes and outcomes of learning (Shuell, 1986:411; Marton, 1988:59).

Although a variety of variables, such as the student's level of intelligence and the type of subject, *influence* learning, the student's perception of the goal of learning *determines* to what level he will process information (Winne, 1985:798). Information-processing can be described as the selection, organisation and integration of new information with prior knowledge, or the way in which new information is encoded and remembered (Mayer, 1989:46). Content-relevant goals stimulate surface processing of information and memorisation, whereas process-relevant goals lead to deep processing and understanding. The student's goal-orientation thus directs his cognitive strategies and processes and determines *how* information is acquired, accessed, processed and organised, what the learning outcomes will be and how these outcomes will be used in performances (Gagné, 1985:55-57).

The student's goal-orientation not only develops into a specific approach to learning, but also to *motivation*. Once the student has set himself a specific learning goal, he uses self-evaluation to determine whether his learning performances and results correspond to the goal. Self-evaluation is thus either aimed at what and how much has been learnt, and is then quantitative in nature, or at how learning occurs, when it is qualitative in nature. Content-relevant learning goals lead to performance-oriented motivational patterns, whereas process-relevant goals foster learning-

through the primary and secondary school years, can eventually result in a fixed performance-orientation and a lack of development of critical thinking (Schmeck, 1988:15-16).

Since the goal of a performance-oriented student is to gain good external evaluation or material rewards, he uses learning and motivational strategies that assure success and minimize chances of failure (Ames & Archer, 1987:261). The student bases his evaluation of his level of performance and self-efficacy solely on the level of recall of information or skills and his achievement score. Metacognitive monitoring, if exercised, is therefore focused on retention and not on understanding (Corno, 1988:182-183).

A product-oriented approach to learning has limited value. It leads to surface processing of information and the retention of learning content, which very often reflects a mere compilation of unrelated facts, principles, and theories (Bullock, 1989:159). Learning is, therefore, qualified as product-oriented when the focus is on *what* and *how much* is being learnt (Mayer: 1988:12; Marton, 1988:54; Winne, 1985:797).

Although performance-based learning is relatively dysfunctional, since it prevents independent learning and intrinsic motivation, it can be appropriate for learning ready-made information, such as concept clarification and definitions (Bullock, 1989:160; Jacob, 1982:226).

### **2.3.3 A process-oriented approach to learning and motivation**

A process-oriented approach to learning and motivation has an active and constructivistic nature, since knowledge formation occurs as the result of the student's cognitive processes of guided and independent inquiry (Jacob, 1982:223 and 230). As the selection, organisation, and integration of prior and new information refers to the level of processing (Mayer, 1989:46), this can be called the *how* of learning. Deep processing of information determines not only how effectively the student learns, but also how much he learns and transfers to related problem-solving situations (Mayer, 1988:53).

A process-oriented approach to learning also requires metacognitive knowledge and skills that the student uses to analyze, structure, monitor, and sustain his mental and motivational processes (Weinstein & Mayer, 1986:315-317).

### **2.4.1 Active participation in learning**

A process-oriented student is an active processor, encoder, and interpreter of information (Corno, 1988:186; Baird and White, 1982:229). He is not a passive recipient of knowledge, but a collaborator in the teaching-learning situation, since he uses cognitive strategies to regulate and control, not only his level of information-processing, but also events in the instructional environment (Meichenbaum, 1985:415; Winne, 1985:796). What and how much is learnt, and how he learns, depend on the student's motivational orientation, intelligence, and ability to process information in a suitably self-directed and regulated manner, using task-specific learning strategies (Pintrich, 1988:69; McCombs, 1987:1; Meichenbaum, 1985:419). Motivation influences the selection and acquisition of information, as well as the construction of meaning during the encoding process (Bandura, 1989:729; Weinstein & Mayer, 1986:315-316).

### **2.4.2 Deep information-processing**

Information-processing, which forms the mediating variable between learning and its outcome, can be described as the independent transformation of symbolic representations to personally comprehensible concepts (Bandura, 1986:390). It occurs in the working memory through cognitive processes of selection (focusing on specific information), acquisition (encoding of information), construction (formation of organisational frameworks among ideas and concepts), integration of new information with prior knowledge, rehearsal, transfer, and problem-solving. The effectiveness of information-processing depends not only on the quantity of knowledge that a student gains, but also on the qualitative organisation and structure of that knowledge (Pintrich, 1988:67- 69).

A process-oriented student uses a variety of cognitive strategies to process information so that new and prior knowledge are fully and methodically integrated, organised, and easily retrievable. It follows that such effective processing, transfer, and use only occur when the learner is well motivated to master the task. A process-oriented student is, therefore, intrinsically motivated to use learning strategies that will ensure deep encoding and comprehension, and that will result in functional knowledge and skills (Ames & Archer, 1987:261).

to controllable causes, stimulate self-efficacy, expectancy of future success and a positive academic self-concept. Continuous negative outcomes, especially when attributed to uncontrollable causes, lead to low levels of both self-efficacy and expectancy, and a negative academic self-concept (Bandura, 1982; Schunk, 1984 and 1985; Dweck, 1986; Corno, 1986). According to Pintrich and De Groot (1990:2) various studies have shown that higher levels of self-efficacy result from metacognitive involvement.

Metacognition thus enables the student to instigate, direct, sustain and control his learning behaviour, in other words to become intrinsically motivated (Meichenbaum, 1985:409).

## **2.5 CONCLUSIONS AND EDUCATIONAL IMPLICATIONS**

Technological advance and the contingent information explosion have led to more process-oriented educational goals, and one cannot but come to the conclusion that a product-oriented approach to learning is incompatible with these goals (Clever, 1988:270). This of course implies that lecturers and teachers must change their instructional approaches and practices in line with modern educational goals. Their willingness to do so, however, is dependent on how clearly and specifically the new practices are presented, how well the practices are aligned with their educational philosophies and how much time and effort the new practices require, compared to the benefits they are likely to yield (Guskey, 1988:63).

Traditionally examinations were directed at evaluating content and a product-oriented approach to both instruction and learning was appropriate for the purpose. The student and the teacher both aimed at maximising the student's retention and recall, by concentrating on the knowledge that they perceived to be the most important. Learning was directed by the evaluation of the most probable questions that could be asked in an examination paper which, of course, resulted in instruction aimed at the preparation for examinations. According to Currie (1988:83) preoccupation with academic achievement replaces concern for the total student and is self-defeating, if the goal is to encourage physical, social, emotional and intellectual development, especially of the younger student.

Although Bullock (1989:160) reasons that a product-oriented approach does have some merit since students will always have certain basic techniques, skills, and

The focus is diverted from content and placed on the links between content and the mediating variables such as knowledge structures, learning strategies, self-evaluation and motivation (Pintrich, 1988:77). The student is taught *how* to think, not *what* to think, and guided to acquire the self-management skills of goal-setting, strategy-planning, and self-monitoring (Meichenbaum, 1985:414). Maqsd and Pillai (1991) report that standard ten students who self-evaluated their learning performances for two weeks, performed at a higher level than those whose performances were evaluated by the teacher.

Self-confidence and intrinsic motivation are stimulated by specific feedback aimed at the student's cognitive and motivational characteristics. The student is guided to attribute learning successes or failures to variables that he can control as this stimulates self-efficacy and self-control (Paris & Winograd, 1990:27-28). Students who lack control over academic performance are incapable of benefitting from good instruction (Perry & Penner, 1990: 262-262). Loss of control results from a product-oriented approach to teaching and learning, performance-oriented goals, non-contingent and non-specific feedback, poor organisation, unannounced tests, and excessive content.

According to Paris and Winograd (1990:31) "effective teachers display both empathy and expertise; they guide students' learning with sensitivity. Classroom practice should allow teachers and students to discuss their thoughts and feelings about learning to promote metacognition and motivation".

Process-oriented instruction leads to deep information-processing since it stimulates the acquisition of new learning strategies, which enable the student to solve problems independently and to sustain his learning by means of motivational strategies. According to Pintrich and De Groot (1990:36) goal and task structure (i.e. motivational variables of learning), as well as cognitive and metacognitive learning strategies, need to be taught or changed in order to enhance the learning endeavour of students. There is a need to incorporate motivational or "will" components and cognitive or "skill" components in instruction, in order to foster more self-regulated learning in students (Pintrich & De Groot, 1990:36).

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## CHAPTER 3

### MOTIVATION TO LEARN: THE ROLE OF SELF-EVALUATION, SELF-EFFICACY, GOAL ORIENTATION AND ATTRIBUTIONS

#### ABSTRACT

Motivation is described within the context of the expectancy-value theory with emphasis on attributions, self-efficacy and goal orientation. Self-evaluation by means of cognitive capabilities of symbolizing, forethought, vicarious deduction, self-regulation and self-reflectivity, gives the student the necessary self-knowledge of the value he attaches to a learning task, and his expectancy of success. Self-evaluation influences motivation vicariously, as it helps the student to discern his reasons for engaging in a specific task, and to judge his abilities, effort and learning outcomes in the context of the type, and difficulty level of the task. Through guided self-appraisal, based on cognitive, affective and conative involvement, the student develops specific beliefs about the causes to which he attributes performances, his level of self-efficacy and the type of goals he pursues. Each of these three constructs, separately and interactionally, is described and the educational implications, for students and lecturers at university level, are discussed.

#### 3.1 INTRODUCTION

Motivation can be defined as the degree to which students are willing to commit effort to achieve goals they perceive as meaningful and worthwhile. Motivation consists of diverse elements, such as information-processing, perceptions of feedback, metacognitive awareness of one's intentions to learn and evaluate performance behaviours, and the merging of awareness and thought, when concentrating on attaining specific goals (Johnson & Johnson, 1985:250). As cognition and affect both influence motivation, it is a complex construct of which the most distinctive characteristics need to be clearly delineated.

Within most course-domains, researchers have consistently sought to identify the motivational determinants of learning and achievement behaviour. A unifying perspective is brought to this area of research by the expectancy-value theory (Ethington, 1991:156; Feather, 1988:381; Pintrich, 1988:75). The key characteristic of this theoretical approach is that it relates actions, such as choice

and meaning to self-evaluation of performances, behavioural patterns, physiological reactions and extrinsic feedback (Bandura, 1986:106). Internal models also regulate causal attributions which serve as conveyers of efficacy information (Bandura, 1986:349).

*Forethought* is the cognitive representation of the future in the present derived from enactive, symbolic and vicarious sources (Bandura, 1986:19). It enables the formulation of learning goals, the structuring of plans of action to attain the goals, and expectancies about possible outcomes. Outcome expectancies, or the judgement of consequences of behaviour is dependent on judgements of one's capability to accomplish a certain level of performance. High self-efficacy sustains motivated effort even when faced with uncertain outcomes, while low self-efficacy nullifies outcome expectancies (Bandura, 1986:231, 391). Forethought thus induces motivation and sustained effort (Bandura, 1986:230, 233).

The *vicarious capability* lends the student the capacity to gain self-knowledge by observing the behaviour and behavioural results of similar others, on condition that the modelled behaviour is important to him. He thus acquires rules for generating and regulating behavioural patterns and reduces trial and error with the accompanying feelings of failure (Bandura, 1986:19). Observing similar others perform a task that is dependent on, not only inherent characteristics, but also on skills, strategies and knowledge, serves as a source of outcome expectancies and self-efficacy. Modelled behaviour is not imitated automatically, but is evaluated on its outcomes, social reactions and rewards. Evaluation of own behaviour also regulates which observationally learned activities are most likely to be pursued. Lack of experience and efficacy notions make new learning tasks especially susceptible to vicarious modelling (Bandura, 1986:68, 69).

The *self-regulatory capability* enables the comparison of performances to internal standards of excellence (Zimmerman, 1985:139). Since learning is directed at outcomes and often occurs without external feedback, self-regulation sustains motivation. Self-regulation ensues from self-observation, self-judgement and self-reaction (Bandura, 1986:336). Self-observation directs attention selectively at behavioural patterns that appear to be valuable and functional, and aids the organization of performance information. The student thus gains self-knowledge to set realistic goals. The goals form the internal standard to which performances are compared and generate self-reactions (Bandura, 1986:337). Self-judgement is elicited when performances are relevant to the personal sense

success. He thus discerns his reasons for engaging in the task and judges his abilities, effort and learning outcomes in context of the type of task (Pintrich, 1987:4). Through guided self-evaluation, based on cognitive, affective and conative involvement, the student develops specific beliefs about *attributions, self-efficacy and goals* (Zimmerman, 1985:118; Bandura, 1977:193).

Attributions refer to beliefs about the determinants of behaviour, while self-efficacy refers to the student's beliefs of what he can do with whatever skills he possesses, and involves perceptions of competence. Goals relate to beliefs about reasons for learning (Bandura, 1986:391) and forms the internal standard to which the student compares the success or failure of learning results. The goal directs the student's behavioural intent and the degree to which he perceives a certain task to be either a threat to competence evaluation evoking anxiety, or a challenge stimulating self-worth (Covington & Omelich, s.a.:7). Dweck (1989:88) differentiates between learning goals, aimed at increasing competence, and performance goals aimed at the documentation of competence (Dweck, 1989:89).

Goal orientation is thus mediated by attributions and self-efficacy. The student's goal and expectancies of goal attainment determine whether he perceives himself, or others to be responsible for his learning, how he judges his competence as a learner, and what causes he attributes to results (Zaleski, 1988:563; Corno & Rohrkemper, 1985:58).

According to Bandura (1986:469) motivation does not derive from the goal itself, but from the student's evaluation of whether his behaviour can be instrumental in attaining the goal. The goal designates the internal standard to which task acceptance and performances are compared. A moderate negative discrepancy between the goal and feedback on competence and skills stimulates the drive to lessen the discrepancy, while a large negative discrepancy evokes beliefs of hopelessness (Kernan & Lord, 1988:76). Feedback, whether self-conceived, vicariously inferred or stated by others, must be specific for discrepancy-inferalls to be made, as non-specific feedback is poor incentive for task acceptance (Battmann, 1988:58; Hirst, 1988:97).

Goal orientation, mediated by attributions and self-efficacy, influences discrepancy-inferalls (Dweck, 1989:105; Battmann, 1988:58). A student, for example, has to choose between mathematics (a difficult course for which he possesses the necessary sub-skills, but doubts his ability to perform well, due to previous failure), or history (which is generally accepted as an easier course and

and so forth, and influences the learning of new material more than it does familiar material (Schunk, 1985:210).

Through the cognitive capabilities the student infers efficacy knowledge by evaluating and interpreting his own performances, the performances of similar others, feedback of significant others and physiological reactions (Schunk, 1985:209). As the influence of the sources relates to their dependability, personal performances are viewed as the most influential (Bandura, 1977:191).

Whereas repeated failures lower self-efficacy, repeated successes raise the level of self-efficacy. Occasional failures, on the other hand, do not have such an immediate effect on the level of self-efficacy, given that the student interprets them within the pattern in which they occur, the type of task, amount of effort expended and external aid received (Bandura, 1986:401; Schunk, 1991:122).

Should the student fail at a task that is generally accepted as difficult, his self-efficacy will not suffer as much as when the task is easy. He would, however, experience a sharp decline in self-efficacy if, despite much effort and external aid, he fails to master an easy task.

Self-efficacy has noticeable effects on learning and motivation in classroom settings as it influences task, or course choice, effort expenditure, persistence and learning in general. Students with high self-efficacy will readily choose difficult courses, such as mathematics and physics, while those with low self-efficacy will avoid them. High self-efficacy stimulates effort and persistence when problems are encountered, while low self-efficacy leads to doubts, avoidance techniques and lack of effort (Schunk, 1991:121). Much self-efficacy information is also gained from observing the performances of similar others. If peers succeed, the student may judge his capabilities to be the same and may expect to succeed as well. This expectation enhances his self-efficacy vicariously and induces motivation to act. Should he fail, his vicarious sense of self-efficacy will decline, as it would if he observes similar peers fail (Schunk, 1991:122).

Persuasive feedback by others is also subject to personal interpretations and proof through performance, before such feedback will have any sustained influence on the student's self-efficacy. The student can also interpret physiological reactions, such as excessive perspiration or accelerated heartbeat, as indication of his incapability to learn or perform (Schunk, 1991:122).

orientation (Ames & Archer, 1988:260; Kim & Clifford, 1988:28). Individual, but non-competitive goals, generate self-control, self-challenge and self-efficacy as the focus is on mastery rather than evaluation (Ames, 1984:479; Johnston & Winograd, 1985:287). With cooperative goals the responsibility for outcomes are shared and fear of failure decreases, more positive attitudes towards task performance are experienced, and learning goals are generated (Garibaldi, 1979:788; Kim & Clifford, 1988). Competitive goals, however, focus attention on comparison of own performances and achievements to those of others and stimulate performance orientations (Johnson & Johnson, 1985:258).

### **3.4.2 The influence of goal orientation on motivation**

Dweck (1989:98) reports that, with the mediating influence of conceptions of intelligence, performance goals can promote effective motivation for challenging tasks, but are generally less conducive to learning than learning goals. Learning goals generate internal standards of performance, emphasising effort and competence, while performance goals elicit normative standards emphasising performance and ability (Dweck, 1989:99). These standards determine task acceptance and interpretation of task progress and outcomes.

*Task acceptance* relates to expectancies of success and type of task. Tasks and courses can be classified according to type of content and instructional method. The content of some courses, such as history, is based on adult decision-making and collective opinion, and lends itself to passive transmission of knowledge and to learning strategies such as memorisation. Mathematical content and logic, on the other hand, can not be mastered merely through memorisation; the student needs to actively become involved before he can understand and apply such knowledge to problems (Piaget, quoted by Jacob, 1982:227). A student has to be learning-oriented to master mathematical or logical tasks. Goal orientation, however, does not influence tasks of a purely factual nature, as much as it does tasks of a highly conceptual nature (Kernan & Lord, 1988:84).

As learning goals are based on the evaluation of the role of effort and strategies in goal attainment, students readily choose or accept challenging tasks and expectancies of success are high (Dweck, 1989:99). Learning-oriented students accommodate ambiguous and complex learning tasks which stimulate intellectual reflectivity and a thinking disposition (Kroll, 1988:338). Interest and the value of new skills and knowledge stimulate the choice for challenging tasks and sustain

strategy inferences. Ability, interpreted as the main determinant of performance, generates performance goals, while effort and strategies as determinants generate learning goals. A learning-oriented student, however, may choose easy tasks if his self-efficacy is low. Self-efficacy thus mediates the influence of goal orientation on behaviour, whereas attributions mediate the influence of goal evaluation on goal orientation. An intrinsically motivated learner can thus be described as an active participant in learning, manifesting strategically goal-oriented behaviour which promote the establishment, maintenance, and attainment of personally challenging and valued achievement goals (Johnston & Winograd, 1985:281; Dweck, 1989:89).

### **3.5 THE INFLUENCE OF ATTRIBUTIONS ON MOTIVATION**

Attributions can be described as a system of beliefs about the reasons why an event has occurred, and is inferred from self-evaluation of the results and consequences of behaviour. The self-evaluative process leading to attributional belief systems is described first, after which the influence of attributions on motivation is discussed.

#### **3.5.1 The attributional process**

Thoughts about causes guide behaviour, especially after failure situations, unexpected outcomes and when the task is perceived to be of importance to the student (Weiner, 1988:99; Weiner, 1979:4). The student identifies the most salient determinants of different learning tasks (inter alia, ability, effort, desire to do well, strategies, external help, teaching, chance or task difficulty; Van Overwalle, 1989:400) through self-evaluation and situational cues. He attempts to explain learning results by comparing, for instance, his ability to the amount of effort he has expended, the difficulty level of the task and environmental influences. The causal decision reached, is influenced by the specificity and credibility of available information, causal rules and ego-defensive biases, the developmental level of the student and prior experiences (Schunk, 1990b:5; Weiner, 1988:100; Peterson & Gelfand, 1984:504). Attributional beliefs, in turn, influence expectancies, emotions and performances (Van Overwalle, 1989:400).

The attributional belief system does not relate only to the choice of specific attributions, but also to the student's judgement of the locus, stability and control

lecturers and peers (Ladd & Price, 1986:446), form the basis of relatively stable motivational patterns (Entwistle, 1987:137).

The interaction between the stability and control dimensions of causal attributions have a differential effect on expectancies. Success or failure ascribed to an unstable, but controllable cause, such as effort, furthers future expectancies of success. Failure ascribed to a stable and uncontrollable cause (i.e. a static view of ability) evokes feelings of helplessness (Zaleski, 1988:563; Goetz & Dweck, 1980:254). Effort as the causal determinant of failure is a double-edged sword, however, as increased effort could still lead to failure and thus stimulate the belief of low competency (Covington & Omelich, s.a:2).

Expectancies evoked by external feedback are subject to sex differences based on cultural stereotyping and prior experiences. As males mostly ascribe ambiguous negative feedback related to task-failure, to the negative and critical attitude of the lecturer, neither their self-esteem nor their expectancies are influenced by such feedback. Males more readily develop adaptive motivational patterns, seeking the causes of success in ability or effort, and those of failure in external causes (Clifford, 1988:16). Females, however, mostly experience positive feedback and are greatly affected by negative feedback when it occasionally occurs. Traditionally classified as a hard worker, failure can not be attributed to low effort, and is consequently ascribed to low ability (Dweck, Davidson, Nelson & Enna, 1978:275). Thus females more often develop maladaptive motivational patterns, especially in highly conceptual subjects such as mathematics. They show less perseverance when faced with difficulties, ascribe failure to lack of ability, and success to good teaching. Such females have low self-esteem and become helpless when continued failure occurs (Bandura, 1986:350; Dweck, 1986:1044).

As helplessness ensues from the belief that ability viewed as a stable entity, primarily determines outcomes, performance-oriented students are more likely than learning-oriented ones to become helpless. Such learners take less responsibility for their successes and their failures, and consequently do not persist when confronted by failure, but abandon the more difficult tasks (Borkowski, Carr & Rellinger, 1990:68). Learned helplessness can thus be explained as dysfunctional attributional beliefs. According to Wood, Schau and Fiedler (1990:2-3) attributional patterns determined by dimensional perceptions typify students to be learning- (or mastery-) oriented versus selfhelpless, and as having high or low self-efficacy. Learning-oriented students typically ascribe

Feedback aimed at competence information is one of the most influential external determinants of intrinsic motivation when given in a meaningful, realistic and positive context. The more dependable the source of feedback, however, the more influence it has. Positive lecturer-student commitment, based on personal knowledge of each other, can stimulate confidence in students to choose more conceptual tasks and courses.

The lecturer's level of self-efficacy also influences his commitment to students. Lecturers with high self-efficacy more readily commit themselves to students and have higher expectancies of student achievement. Lecturers with low self-efficacy believe that the environment or uncontrollable factors limit their teaching abilities and are consequently less committed to students (Czerniak & Chiarelott, 1990:49-52). Tertiary education, especially teacher education programmes, should thus concentrate on raising the levels of self-efficacy of students, by using methods such as contract grading requiring self-directed learning, modelling, and class discussions on ways to influence classroom and curricular decisions.

Regular feedback by the lecturer of the effect of self-controlled effort on skills, competence and goals, can stimulate incremental conceptions of ability and learning goals. Emphasizing control implies that competence, as well as ability, can be increased. Schunk (1990a:3-4) warns, however, against unsolicited assistance as this signals lack of control and low ability to students. Lecturers who give students more autonomy, stimulate independent mastery, whereas control-oriented lecturers stimulate dependence (Green & Foster, 1986:34). Independent mastery is probably due to more perceived self-control over learning, resulting in feelings of competence. Task-related comments (i.e. verbal or written comments directly related to students' work), task choices, learning goals focusing on effort, short-term goal setting and cooperative learning, stimulate intrinsic motivation (Kurita & Zarbatany, 1990:5).

Students can thus be taught to take control of learning by ascribing the most suitable causes to learning outcomes, developing learning-directed goals and enhancing self-efficacy beliefs. Such a self-motivated learner will be able to meet the learning demands by choosing courses compatible with his competence.

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value of learning, knows what results he can expect from learning and is intrinsically motivated to learn. Intrinsic motivation can be enhanced through a process-oriented approach, which focusses on the psychosocial foundations of thought and personal determinants of learning (Bandura, 1986:xi).

The question of the acceptability of the process-oriented motivational approach to Christian education is addressed. Before a Christian perspective on the process-oriented approach can be given, intrinsic motivation, the process-oriented approach and a Christian view of motivation have to be described.

## 4.2 INTRINSIC MOTIVATION

Motivation deals with how the individual student interprets his own characteristics, the characteristics of the social-instructional classroom environment, and the learning task (Botha, 1988:16; Corno & Rohrkemper, 1985:53; Weiner, 1984:17). Corno and Rohrkemper (1985:53) define intrinsic motivation as an internal facility for learning that sustains the desire to learn. "Internal facility" refers to the student's motives or intentions and delineates the distinction between intrinsic and extrinsic motivation. A student whose learning goal is personal understanding, is intrinsically motivated, whereas a student who learns to fulfill the requirements of others and gain their approval, is extrinsically motivated (Entwistle, 1988:22). McKeachie, Pintrich, Lin and Smith (1986:85) view intrinsic motivation as the need to deal effectively with the environment in order to become more competent. The student thus becomes actively involved with the learning task. He engages in and sustains learning by exploring and manipulating his attention, thoughts and communication.

The level of intrinsic motivation is determined by how the student interprets personal experiences, performances and performance results (Weiner, 1984:17). The student's interpretation, in turn, is dependent on his perception of the level of difficulty of the learning task and his motives. Intrinsic motivation is influenced positively if the student feels himself capable of making independent judgements and is not totally dependent on the guidance of the teacher. In other words, he feels himself competent enough to rely on his own internal criteria for judging success and failure and does not have to rely on external evaluation only (McKeachie et al., 1986:86).

1984:18). The student's perception of self-efficacy, his decisions, strategies for dealing with threat and anxiety and perceptions of goal expectancy, often appear rational to himself, but totally irrational to others. Although many students react sub-consciously and automatically to learning and fail to question their motives, they, nevertheless, have the potential to do otherwise as they are endowed with specific cognitive capabilities necessary for conscious cognitive processing.

### 4.3.2 Cognitive capabilities that enable self-evaluation

Self-evaluation, being a subjective cognitive process, refers to the student's interpretation of what he is capable of doing with the skills and abilities he believes he possesses or can gain (Bandura, 1986:391).

Self-evaluation occurs through the capabilities of symbolizing, forethought, vicarious deduction, self-regulation and self-reflectivity. *Symbolizing* means to analyse personal experiences in order to extract information about the self as a learner. This information is structured into internal models, or beliefs, that serve as motivation to act. Beliefs about behavioural causes, self-efficacy and the goals of learning are based on symbolized thought, which forms the basis of the other capabilities (Bandura, 1986:106 and 349).

*Forethought* is the cognitive representation of the future in the present. It enables the student to form expectancies about performance and results, or to judge performance in advance in order to plan actions to attain certain goals. Forethought induces motivation and sustained effort to act so that the cognitive representations can be realised. Through the *vicarious capability* self-knowledge is gained by comparing personal competence and possible performance to the observed behaviour of similar others (Bandura, 1986:19). The vicarious capability, as well as the self-regulatory capability, relates to both personal performance and social interactions as sources of self-knowledge and control. The *self-regulatory capability* enables the student to observe, judge and react to his own performance and to those of others. Behavioural patterns perceived to be effective, are identified and used. During task performance behavioural patterns are compared to the symbolized internal standard or model, and if the behavioural patterns are found to be ineffective, they are changed (Bandura, 1986:337). *Self-reflectivity* means that the same student who thinks, acts and feels, can later think about his thoughts, feelings and performance. The self-reflective capability enables the student to relate all his capabilities as a unity to

Personal performance is analyzed in terms of the goal of the learning task (i.e. the internal standard against which the student measures the success of his performance). Continuous goal-evaluation develops into a specific goal-orientation. The student's goal of learning can either be to improve his competence (a *learning orientation*), or to validate his competence through external evaluation (a *performance orientation*). Learning-oriented students value learning because of the competence they can gain, while performance-oriented students evaluate learning results in terms of grades and social approval (Zimmerman, 1985:118; Bandura, 1977:193). According to Dweck (1989:89) learning-oriented students experience more control over and responsibility for learning and are more intrinsically motivated than performance-oriented ones. They are willing to invest high effort into difficult tasks, have realistic self-efficacy beliefs and are less influenced by failure (Dweck, 1989:98).

Self-evaluation leading to expectancies of success and emotional reactions, is influenced by beliefs about self-efficacy and about the causes of behaviour (Pintrich, 1988:75). By evaluating his performance and results, the student determines what he can do with the skills and competence he has, and forms beliefs of *self-efficacy* (Bandura, 1986:391; Paris & Winograd, 1990:28).

Successful performance influences self-efficacy positively, while repeated failures lower the level of self-efficacy. The less failure is attributed to variables the student feels he can control and alter, the more the adverse effect failure has on self-efficacy. Students who are certain of their capabilities, blame occasional failure on variables such as poor learning strategies or low effort (Bandura, 1986:399). Those who doubt their capabilities, attribute failure to uncontrollable variables such as low ability or poor teaching methods, and suffer a decrease in self-efficacy with each new failure (Bandura, 1982:140). Students with high self-efficacy choose difficult tasks as self-efficacy sustains motivated effort even when the learning outcome is uncertain, while students with low self-efficacy avoid tasks of which the outcome is uncertain. Low self-efficacy thus influences expectancy negatively (Bandura, 1986:231).

As self-evaluation is a subjective process, self-efficacy beliefs can be based on inadequate information, misinterpretation of learning events or faulty inferences about abilities. Prior learning experiences can also create judgemental biases leading to misconceived self-efficacy (Bandura, 1986:19, 349). Despite misinterpreted information or judgemental bias, the student's perception of his competence to him appears to be sound and influences his motivation. A

Through the vicarious and self-regulatory capabilities the student deduces his competence from observing similar others perform a task, especially when the task is more dependent on skills, strategies and knowledge than on ability (Bandura, 1986:301). If he judges his competence to be equal to those of others who succeed, he will expect to succeed as well. Should he judge his competence to be lower, he may doubt his chances of success. According to Schunk and Hanson (1989:431) the learning attributes displayed by peers, influence motivation differentially. Students perceive peer-models who display mastery and verbalize positive achievement beliefs, and those who experience initial difficulties, but then display coping behaviours, to be competent and themselves to be equally competent. Models who initially experience difficulties when learning, verbalize negative emotive statements and then display coping behaviours, are perceived to be less competent than the student who observes them.

Competence and skills are also interpreted in terms of feedback and expectancies of significant others. Considering that both external and personal interpretations of the student's competence and attributions are often biased, disagreements often occur between the student's perception of his competence, and perceptions of teachers and parents (Juvonen, 1988:330). Realistic feedback, aimed at giving information on skills and competence, influences the student's motivation more than purely affective feedback (Entwistle, 1987:137).

When experiencing failure, a student tends to interpret the offer of help and sympathy as signs of low ability, whereas he interprets blame, relative neglect and anger as signs of high ability, but low effort. The student's interpretation of verbal or affective feedback, influences his perception of personal ability, expectancies of success, affective reactions and performance (Meyer, 1982:888). Ames and Archer (1987:409) report that the mother's goal-orientation influences her perception of her child's learning endeavours, the type of feedback she gives and her expectancies. A mother with a performance orientation expects high achievement of her children. Such expectancy will have a detrimental effect on the motivation of a child who doubts his ability and achieves below the mother's expected level.

Intrinsic pride and extrinsic praise are experienced when success is attributed to effort. Pride in own accomplishments and teacher rewards decrease, however, when success is attributed to external variables (Covington & Omelich, 1979:688).

#### **4.4.1 God as the Origin of man's self-knowledge and self-control**

God created man analogous to Himself, and called him to be His representative on earth in what he is and does (Heyns, 1982:192). As God is a Holy Trinity, with Father, Son and Holy Spirit existing in a triune relationship with each other and with the cosmos, so man (inter alia as student) exists in relationship with God, himself, his fellowmen and the cosmos (inter alia the learning task). The student's behaviour (of which learning and motivation are aspects) reflects the image of God, although imperfect, as does the products of his behaviour (inter alia learning outcomes) (Heyns, 1982:192-193).

Although man volitionally severed the bond between God and himself by choosing to deny his obedience to and dependence on God, Christ justified man by redeeming his sins, calling him to full obedience made possible by the Holy Spirit living in his heart (Postma, 1987:2-3). Despite the fact that man's nature has become disposed to direct his will at that which is wrong, he did not lose the ability to direct his will at that which is right. Human behaviour, including learning, is thus motivated from either a Christian or another religious radix (Van der Walt, Dekker & Van der Walt, 1983:109).

The Christian interprets self-knowledge and self-control in the light of God's Word, which is the norm for the quality of man's existence and behaviour, thus how he ought to be and behave (Berkouwer, 1957:18). Being qualified by norms means that the student is not a passive responder, but an active agent with a will, who can control his behaviour, make choices and accept responsibility (Heyns, 1982:194). The vocational, volitional and control characteristics of the student find expression in his motivation to learn.

#### **4.4.2 Self-reflection as a source of self-knowledge and control**

God's call to discover, develop and rule the earth demands an active, obedient and responsible answer from the student (Berkhof, s.a.:40). Such an answer requires self-reflection, since the student has to know who he is and what he is capable of, before he can decide how to behave obediently and responsibly (Heyns, 1982:196). To know himself as a person and an active agent, he is to relate to God and to himself and to respond to himself as to God (Postma, 1987:2). Self-reflection in the light of the Scripture leads to self-knowledge, self-control and intrinsic motivation as it enables the student to interpret how much

peer-relationships and have a differential effect on the student's motivation. The teacher's position of authority lends more weight to his evaluation of the student's abilities and influences the student's beliefs about self-efficacy more than the evaluation of peers or parents, who are often not recognized as authorities on the subject of learning.

Interpersonal relationships are, however, based on the personal relationship with God. If this relationship is severed, the student's relationship with himself, others and the learning task is also disturbed (Duvenage, 1983:110). He then bases his self-knowledge, self-acceptance, self-esteem, and self-efficacy on norms set by others, instead of by God's Word (Postma, 1987:3; Van der Walt et al., 1983:104). In order to interpret the information gained from social sources of self-knowledge and control truthfully, the student must also evaluate such information from a religious perspective.

#### **4.4.4 Learning behaviour as a source of self-knowledge**

The student's God-given potentialities find expression in his learning behaviour. In the motivational context this implies that the student who knows his learning potential, will be motivated to use it when learning.

The student learns in response to God's call to discover, develop, conserve and create from nature what God placed in nature (Berkhof, s.a.:26). There is thus an interdependence between him and his learning tasks, or a means-goal relationship, since task performance enables him to discover and develop his competence. Discovery and development of competence can be viewed as the fruits of labour, which can be interpreted in three ways (Van der Walt et al., 1983:148). In the first place, fruits of labour symbolize creative talent. By learning the student improves his ability to transform something into something different, such as using his language ability to write an essay. Fruits of labour secondly refer to the control over and development of one's inherent nature. As such, teaching and educating also bear fruits of labour as the student learns who he is, and how he can control himself, not only by personally evaluating his learning behaviour, but also by being evaluated by others. The fruits of labour are thirdly manifested in behavioural results. To the student this refers to the outcomes of learning; to the educator it refers to the results his teaching has on developing the student's learning potential while, to the educationist, it refers, inter alia, to the theories or approaches he constructs to explain educational

#### 4.5.2 The religious radix of the process-oriented motivational approach

The Christian view of motivation is based on the principle of responsibility and self-control gained through self-knowledge. God created man analogous to Himself, endowed him with the necessary cognitive and conative abilities to behave responsibly according to His will, and ordered him to discover, develop and use his abilities. Learning and gaining self-knowledge are not voluntary acts, but God's commands which have to be answered in a responsible manner. Cuypers (1989:171) argues that, since God endowed the student with the capability to learn and the will to choose and decide, he stands responsible before God for his learning behaviour, performance and achievement.

True self-knowledge and self-control, motivating behaviour, can therefore only be gained in the light of the Scripture, which teaches man how he is supposed to be and to act. According to Sturm (1989:80) the Word, and not man himself, is the norm against which self-knowledge, leading to responsible behaviour and self-control, is to be measured. Although the process-oriented approach to motivation relates the student's evaluation of his abilities, competence and behaviour to personal responsibility, the religious source of the concepts is not recognized.

If self-knowledge, self-control and responsibility are not based on man's relationship with God, who endowed him with the cognitive ability to know and the conative ability to control, they become humanistic in nature and elevate man to God's position (Berkhof, s.a.:91). Self-evaluation is performed by means of cognitive capabilities, but directed by moral norms that guide man's evaluation of himself and his actions to what he is supposed to be and to do (Cuypers, 1989:190).

Responsibility and self-control are thus the fruits of responsible evaluation of potentialities bestowed upon man by God and form the basis of norm-directed behaviour (Sturm, 1989:76). Although sin tarnished man's ability to evaluate himself responsibly, with the consequence that he often misinterprets his abilities and directs his will at pleasing himself and others, instead of God, it does not exonerate him from bearing the responsibility for his own behaviour (Berkhof, s.a.:68). Thus, in order to interpret his abilities truthfully, the student needs to evaluate his personal performance within the context of the Word of God. He must, however, also recognize his sinful nature, and use evaluation by others as an additional source of self-knowledge, since self-esteem, for instance, is very much dependent on the acknowledgement of own abilities by others. Self-

Much attention is given to the emotional state of the learner. Emotions, differentiated by cognition, such as guilt, shame and self-efficacy, are perceived to be the main instigators of action. Perseverance, self-control, self-efficacy, responsibility, selfhelplessness and self-acceptance form central themes, as does positive self-esteem (Weiner, 1985, 559; 1988:93). Since emotional reactions, based on cognition, are also subject to misinterpretation, they must also be evaluated. The student must thus give as much attention to his physiological reactions in which emotions manifest, as to his cognitions and beliefs.

A problem can arise if cognition and affect are interpreted in a too mechanistic manner, lowering man to the level of a machine. The process-oriented motivational approach, however, recognizes the changeable character of man, his imperfect insight and his aptitude for making mistakes. Misinterpretation is, therefore, constantly highlighted and explained (Kernan & Lord, 1988:76; Clifford, 1988:15-16; Kroll, 1988:338). The same concepts which are used to describe rational behaviour, such as values, goal orientation and expectancies, are also used to describe what appears to be irrational behaviour. Students are not viewed as super-humans with unlimited insight, but as fallible beings apt to perceive things as they wish them to be. They can therefore over-estimate or under-estimate themselves and suffer loss of self-esteem and self-efficacy. This view of human nature, although acceptable to the Christian, does, however, not relate the student's inabilities and misinterpretations to its religious source, namely man's sinful nature.

The process-oriented approach to motivation recognizes the student, not only as an individual, but also as a social being who can be motivated through vicarious experiences, feedback and modelling (Bandura, 1986:111, 301; Entwistle, 1987:137). Self-knowledge is also inferred from the reactions of significant others, such as parents, peers and teachers. Their influence is determined by the student's perception of their dependability, since the student is not externally controlled, but acts in accordance with his interpretation of the reactions of others. The process-oriented approach places motivation in perspective of the classroom situation and also explains the influence of competition on motivation. The student is thus not viewed as self-sufficient and totally independent, but as an individual-social human being in need of guidance.

What is problematic, however, is that man himself is taken to be the norm for his own behaviour, whereas, from a Christian perspective, God's Word is the criterium for behaviour and not societal norms (Snik, 1989:122). The solution

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## CHAPTER 5

### RELATIONSHIPS AMONG MOTIVATIONAL VARIABLES AND BETWEEN MOTIVATIONAL PATTERN AND DIFFERENT UNIVERSITY COURSES

#### ABSTRACT

This study tested the hypotheses that (i) there is a relationship among self-efficacy, goal expectancy, attributions and attributional dimensions, and (ii) the motivational patterns of first-year university students differ in accordance with course type (i.e. highly conceptual versus less conceptual courses). In general, the results supported both hypotheses. The results of the empirical study are discussed in the context of previous research relating to the expectancy-value framework of achievement motivation.

#### 5.1 INTRODUCTION

The Republic of South Africa is currently suffering major political, social and economic changes with far-reaching consequences for tertiary education. Universities have to rationalise not only cost-ineffective courses, but also the numbers of academic personnel. Students thus have to ascertain their capabilities to enroll for and succeed in courses with less external help than they are accustomed to. Since students respond to learning according to the nature of the task, prior and current experiences, their abilities, attitudes, personalities, self-perceptions and motivational states, intrinsic interest and motivation to learn are equally important as the above-mentioned cognitive and other variables, which influence academic learning (Crooks, 1988:460). Motivation refers to the perceptions of and control that students have over the causes of learning outcomes, and to their beliefs of self-efficacy, which are mostly domain-specific, and thus relate to specific subject areas (Maple & Stage, 1991:39; Gottfried, 1985:631). As beliefs about behavioural causes, control and self-efficacy differentiate into specific motivational patterns (Dweck, 1986:1040), a study was undertaken to identify the relationships between motivational variables, to determine motivational patterns and to relate such patterns to different university courses.

identify, but also to change attributional styles (Schunk, 1990:5; Van Overwalle, 1989:400; Weiner, 1985:551 and 1988:99). Attributional styles incorporate a continuum from learned helplessness to learned resourcefulness with helpless students experiencing an inability to control learning events, while resourceful students perceive themselves to be in control. Wood, Schau and Fiedler (1990:3) found that, whereas helpless students tended to blame success on external, unstable and specific causes and failure on internal, stable and global causes, resourceful students tended to blame success on internal, stable and global causes and failure on external, unstable and specific causes. Helplessness is characterised by a depressive attributional style in which undesirable life events are attributed to enduring qualities of the self (Tennen, Herzberger & Nelson, 1987:623). External feedback that emphasises incapability, therefore reinforces helpless behaviour, whereas feedback emphasising competence stimulates self-efficacy (Johnston, 1985:155).

The difference between a resourceful (i.e. a student who manifests high self-efficacy) and a selfhelpless student is to be found in the self-evaluation of the role that effort and ability play in the perceived level of accomplishment (Schunk, 1990:5). Performances requiring little effort indicate less competence than do performances requiring high effort, since little effort offers little opportunity for improvement. This is true only of students who are highly task-involved. As ego-involved students base competence on a more differentiated concept of ability and effort, that relates to social comparison, outperforming others denotes high ability (Schunk, 1990:7). University students judged their competence and positive affect higher without social comparison information. With knowledge of amount of effort made available, students who were ego-involved experienced a decrease in competence if others performed as well with less effort, whereas comparative information did not seem to affect the competence judgements of task-involved students (Jagacinski & Nicholls, 1987:107).

Task versus ego involvement concurs with Dweck's (1986:1040) differentiation between learning goals, which direct attention at increasing competence, and performance goals which refer to the wish to gain good grades and favourable judgements about competence. According to Hayamizu and Weiner (1991:226) perceived stability of low ability was negatively related to learning goal tendencies, while, opposite to Dweck's (1986:1040) findings, unstable but

As the aim of this study was to explore the structure of self-efficacy, goal expectancy, attributions and attributional dimensions, and to relate the motivational variables, as structured in motivational patterns, to course type, the following hypotheses were tested: (i) there is a relationship between self-efficacy, goal expectancy, attributional choice and attributional style of first-year university students<sup>1</sup>, and (ii) motivational pattern (i.e. adaptive versus maladaptive) differs in accordance with course type (i.e. highly conceptual versus less conceptual).

The hypotheses were tested in realistic learning settings, since motivational variables are interpreted differently in simulated or unrealistic settings, and students rarely react the same to experimenter-manipulated events as to realistic or natural events (Försterling & Rudolph, 1988:225; Zuckerman, Colwell, Darce, Fischer, Osmun, Spring, Winkler & Wolfson, 1988:748; Covington & Omelich, 1981:797). Jagacinski and Nicholls (1990) found that reducing effort to maintain perceived ability makes more sense to observers than to students in realistic learning situations. Students viewed others to be more likely than themselves to pretend to work or to devalue the task, and generally did not see effort reduction as a viable strategy for themselves and saw it as of little value for others.

## 5.3 METHOD

### 5.3.1 Subjects

The total population of first-year students (N=509) enrolled in four different courses at an independent, rural, Afrikaans-speaking university in the Republic of South Africa were the participants in this study. The number, sex and degree for which the student is enrolled are given per course in Table 5.1. Student numbers differ in the various statistical analyses performed on the data because some students failed to answer all the questions in each section of the questionnaire. As the number of students with missing data is low, it can be accepted that the data of the remaining students is still representative of the total population for each course.

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<sup>1</sup> Goals denote the expectancy of goal attainment. Attributional choice refers to the preference of specific attributions; attributional style refers to the student's perception of the locus, stability and control of the attributions that he prefers.

Consistent with Wood and Locke (1987:1015), students had to indicate whether they could achieve a certain level of attainment (yes) and their degree of confidence in their ability to perform at that level on a 5-point Likert scale. *Self-efficacy magnitude (SEM)* was defined as the total number of yes's and *self-efficacy strength (SES)* as the mean confidence ratings for all items (internal consistency reliability coefficient 0,74). See example 5.1 for a representative sub-scale.

**EXAMPLE 5.1 Self-efficacy sub-scale with 3 options**

*Discrimination.* For which proportion of time that the instructor explains the work, or that you are studying, can you discriminate between more and less important facts, concepts and relationships?

	Yes	Confidence				
1. I can discriminate between more and less important work for 40% or less of the time.	1	5	4	3	2	1
2. I can discriminate between more and less important work for about 60% of the time.	2	5	4	3	2	1
3. I can discriminate between more and less important work for 80% or more of the time.	3	5	4	3	2	1

An eighth subscale, consisting of four highly intercorrelated items (internal consistency reliability coefficient 0,89), measuring *goal expectancy* was included in accordance with Wood and Locke (1987:1017). An additional one-item subscale, namely: Do you learn in order to understand the work without thinking of a specific grade? (yes or no), was added to identify *goal orientation* more directly.

Section B of the questionnaire was aimed at determining how the student views the causes of success and failure of his learning performances, as well as his perceptions of the locus, stability and control of the causes. This section was, therefore, divided into two parts, namely B-1 measuring attributional choice and B-2 measuring attributional style.

**TABLE 5.2 Attribution subscales: Means, standard deviations and reliability coefficients**

Subscale	N	Mean	SD	r
Success/ability	311	15,19	2,63	0,76 (0,77)
Success/effort	310	14,31	3,42	0,89 (0,79)
Success/environment	311	11,72	2,92	0,74 (0,48)
Success/task dif.	311	12,79	2,79	0,67 (0,39)
Failure/ability	308	09,61	2,88	0,67 (0,63)
Failure/effort	311	11,76	2,94	0,74 (0,66)
Failure/environment	305	10,59	2,73	0,38 (0,48)
Failure/task dif.	308	12,34	2,91	0,67 (0,48)

The means for success/ability and success/effort are higher, and the rest lower than those reported by Fennema, Wolleat and Pedro (1979). The discrepancy is probably due to the academic level of the students in this study. As university students have already ascertained their ability to perform, it can also explain the low mean of failure attributed to ability. The low reliability coefficient for the failure/environment subscale can possibly be explained by the variety of types of environment, as students were drawn from four different academic disciplines.

Section B-1 of the questionnaire was scored by summing each of the four success and each of the four failure attributions. From these eight totals could be determined which of the four attributions were perceived to be the most salient in success events and in failure events.

Section B-2, attributional style, was constructed according to Weiner's (1983:534) instructions, Russell's (1982) Causal Dimension Scale and Van Overwalle's (1989) simplification of the Russell-scale. Students were instructed to choose one of the four attributions given for each of the 8 subscales that they perceived to be the most salient determinant of their performances and results. Each of the eight chosen attributions was then rated by students on the dimensions of locus of causality, stability and control. The dimensional scaling was done on a 5-point Likert-scale: 5 being most internal, stable and controllable while 1 is most external, unstable and uncontrollable.

Attributional orientation, which refers to the student's predilection for certain types of attributions, was determined before examining attributional style. A positive attributional style is typified by viewing the causes of success as internal, stable and controllable and the causes of failure as variable and controllable; a

Based on the arguments related to content and information-processing, the courses used in this study were divided into two groups, namely history and physical education, on the one hand, and private law and mathematics on the other. Whereas the contents of the history and physical education courses lend themselves more to memorisation based on a surface approach, the contents of private law and mathematics need to be processed to a deep level (Entwistle, 1988:45). History and physical education were, therefore, classified as of a low conceptual level while private law and mathematics were classified as highly conceptual, with level of conceptuality referring to the level of cognitive processing required to master the type of course content.

### 5.3.4 Procedure

To formulate the questionnaire congruent with course demands, an analysis of the study guides compiled for the instruction of the first semester courses in history, physical education, private law and mathematics, was made. Personal interviews were also conducted with the lecturers of the private law and history courses to gain additional information of course demands. After constructing the questionnaire, a pilot study was done on twenty-five first-year students from the specified courses, to ascertain their comprehension of the questionnaire and the length of time it would take to complete. It was found that only students who were fluent in Afrikaans could interpret the questionnaire sensibly and the maximum amount of time needed for completion was forty minutes. All students who were not fluent in Afrikaans were exempted from further testing.

As self-efficacy, goal expectancy, attributions and attributional style relate to *beliefs* in one's competence to perform (Wood & Locke, 1987:1013), these constructs can only be measured realistically when the student has had ample opportunity and time to form such beliefs. Students were, therefore, tested on the questionnaire after the April-recess, as they by then had already had three months of instruction in the course and had written a major semester test, but had not yet received the results, as motivational beliefs can be changed dramatically by test and examination results (Wood & Locke, 1987:1014). The students could already have formed performance expectancies and competence judgements inferred from class discussions, tutorials and written tests, but could not base such expectancies and competence judgements on achievement results alone.

TABLE 5.3. Significant Pearson Correlation Coefficients for self-efficacy, goal expectancy, attributions and attributional dimensions.

Factors	Variables	N	Max score	Means	SD	SEM	SES	G.exp	S/Ab	S/Ef	S/Env	S/T	F/Ab	F/Ef	F/Env	F/T	S/Loc	S/Stab	S/Con	F/Loc	F/Stab	
Self-efficacy	Self-efficacy magnitude	460	19	14.75	2.07	1.00																
	Self-efficacy strength	460	35	28.00	3.11	.30*																
Goal expectancy	Goal expectancy	457	20	11.85	1.88	.41*	.16															
Attributions for success	Success/Ability	460	20	15.20	2.52	.24	.16	.12														
	Success/Effort	459	20	14.52	3.21	.16	.14															
	Success/Environment	460	20	11.78	2.81			-.14	.34*	.31*												
	Success/Task difficulty	460	20	12.73	2.65	.26*	.14	.21	.42*	.21	.31*											
Attributions for failure	Failure/Ability	456	20	9.79	2.74	-.22	-.16	-.12				.27*										
	Failure/Effort	460	20	11.76	2.82				.18	.13		.27*	.14									
	Failure/Environment	454	20	10.63	2.62				.15	.13		.13	.16	.31*	.32*							
	Failure/Task difficulty	457	20	12.61	2.84	-.20	-.11	-.13	.14	.35*	.30*	.10	.29*	.17	.16							
Dimensions for success	Success/Locus	460	20	15.86	3.00	.16	.20		.24	.35*		.10	-.14									
	Success/Stability	450	20	12.83	3.01		.11	.13	.11			.18				-.14	.20					
	Success/Control	460	20	14.28	3.17	.19	.18		.25	.39*	.10	.18				.11	.48*	.25				
Dimensions for failure	Failure/Locus	460	20	13.84	3.13			-.13						.18	-.10		.22					
	Failure/Stability	459	20	10.64	2.77	-.15			-.19									.35*		.17		
	Failure/Control	459	20	12.80	3.03	.13							-.12	.14	-.18	.14		.13	.22	.37*	.11	

\* Average - to - high magnitude correlation coefficients with medium and large effect sizes; all other correlation coefficients are of a low-magnitude with small effect sizes.

The relationships between the self-efficacy measures, attributions and the attributional dimension variables are important, as the dimensions allocated to attributions determine the student's motivational orientation (Wood et al., 1990:2-3). The two self-efficacy measures correlated positively with a low- to average-magnitude with success attributed to ability ( $r = .24$  and  $.16$  respectively), effort ( $r = .16$  and  $.14$ ); task difficulty ( $r = .26$  and  $.14$ ), the locus dimension ( $r = .16$  and  $.20$ ) and the control dimension ( $r = .19$  and  $.18$ ). This implies that whenever success is attributed to variables that are perceived to be internal and under the control of the student, self-efficacy magnitude and strength are positively influenced. The low-magnitude positive correlation between self-efficacy strength and the stability dimension ( $r = .11$ ) implies that, if the variables are also perceived to be stable, self-efficacy strength would be positively influenced. These results are in line with Wood et al. (1990:2-3) who state that mastery-oriented students, who believe in their own self-efficacy, view the causes of success as internal, stable and global. Although globality was not tested, controllability was, and was found to be positively correlated with self-efficacy. The assumption can therefore be made that, if events can be controlled, they have a potential to be global.

Significant negative low-magnitude correlations were found between the two self-efficacy measures and failure attributed to ability ( $r = -.22$  and  $-.16$ ) and task difficulty ( $r = -.20$  and  $-.11$ ), implying that self-efficacy would be negatively influenced should failure be attributed to lack of ability, or too difficult a task. A negative low-magnitude correlation was also found between self-efficacy magnitude and the stability dimension ( $r = -.15$ ), with the implication that failure attributed to stable variables would lead to a decrease in self-efficacy magnitude. The positive low-magnitude correlation found between self-efficacy magnitude and failure attributed to variables that are under control of the student ( $r = .13$ ) makes sense, and implies that self-efficacy magnitude would not decrease if the variables to which such failure is attributed, could be controlled and learned helplessness could be avoided.

The four attributions for success correlated significantly and positively with one another ( $r = .21$  to  $.42$ ), as did the four attributions for failure ( $r = .16$  to  $.40$ ) and the four attributions for success with the four attributions for failure ( $r = .10$  to  $.35$ ). The only exceptions were the correlations between failure attributed to ability and success attributed to ability, effort and task difficulty, which rendered non-significant correlations.

To summarise, students whose self-efficacy magnitude and self-efficacy strength were high, showed more internal locus and control for success. Students with high goal expectancy in success events had stable expectancies. Students with low goal expectancies in failure events perceived such expectancies to be caused by external factors. For failure events, self-efficacy magnitude was negatively related to stability, implying that self-efficacy magnitude was unfavourably influenced by failure. The positive correlation between self-efficacy magnitude and control in failure events can imply that students, who perceive that they have control over the variables influencing learning, would not experience a reduction in self-efficacy when confronted by failure. Self-efficacy, goal expectancy, attributional choice and attributional style thus correlated with one another, which implies that all four these variables form a part of the student's motivational style.

The second hypothesis addressed the question whether motivational pattern differs in accordance with course type (referring to conceptual level). In order to determine motivational pattern, defined as adaptive versus maladaptive (Dweck, 1986:1040) or helpless versus resourceful (Wood et al., 1990:3), a factor analysis (PROC FACTOR with Varimax rotation method, SAS-Institute, Inc., 1988) was first performed on all the experimental variables (table 5.4). Multicollinearity was also eliminated by means of the factor analysis.

Both the self-efficacy measures (SEM and SES) loaded on factor two, namely self-efficacy. Goal expectancy (i.e. the grade the student expects to gain) also loaded on the self-efficacy factor, as did task difficulty. As task difficulty has to be determined first before success expectancies can be formulated, this factor was a very sensible grouping of the four variables and designates a self-evaluative approach to learning. Attributional style for success (factor 1), and attributional style for failure (factor 4) were also reasonable groupings of variables, as the locus and control dimensions are mostly highly correlated: control needs to be internal if it is to be effective. All the variables in the first factor express intrinsically oriented reasons for learning, whereas the variables in the fifth factor express extrinsically oriented reasons for failure. As the stability dimension (whether for success or for failure) influences emotions (Weiner, 1988), the grouping of these two factors (i.e. 1 & 4) made sense. According to Dweck (1986:1040) views of ability determine goal direction. Factor 7 was therefore also to be expected. Factor 3 seemed reasonable as three of the four attributions for failure were grouped together.

After the motivational patterns of the students had been determined, they were divided into three groups according to the level of their motivational patterns. Group 1, the top third of students with high scores (N = 151), was classified as having adaptive motivational patterns, while group 3, the bottom third of students with low scores (N = 154), was classified as having maladaptive motivational patterns. The middle group, students with average scores, was not used in the analysis. A frequency analysis (PROC FREQ, SAS Institute Inc., 1985) was done on motivational pattern and course group (i.e history, physical education, private law and mathematics) to determine how many students of each course group would be classified as having adaptive motivational patterns, and how many would show maladaptive motivational patterns (table 5.5).

**Table 5.5 Number of students per course with adaptive and maladaptive motivational patterns.**

Motivational pattern				
Course		Adaptive	Maladaptive	Total
History	Frequency	10	31	41
	Percent	3,28	10,16	13,44
	Row pct.	24,39	75,61	
	Col.pct.	6,62	20,13	
Phys. Ed	Frequency	15	30	45
	Percent	4,92	9,84	14,75
	Row pct.	33,33	66,67	
	Col.pct.	9,93	19,48	
Mathe- matics	Frequency	41	33	74
	Percent	13,44	10,82	24,26
	Row pct.	55,41	44,59	
	Col.pct.	27,15	21,43	
Private Law	Frequency	85	60	145
	Percent	27,87	19,67	47,54
	Row pct.	58,62	41,38	
	Col.pct.	56,29	38,96	
Total		151 49,51	154 50,49	305 100,00

the amount of effort he should expend to attain his goal, and to relate both ability and effort to internal and controllable variables, manifesting a more adaptive motivational pattern.

These research results concur with those of Platt (1988) who found that ability and effort attributions combined to influence the motivation of first-year college students. In terms of Wood et al.'s (1990) terminology, resourceful students view themselves as being in control of learning events and attribute success to internal, stable and global causes. Although globality of causes was not measured, internality and controllability were, and the results indicated a definite correlation between self-efficacy and attributional dimensions of internality and controllability for success events. For failure events, however, ability and task difficulty correlated significantly with self-efficacy and goal expectancy, while stability correlated with self-efficacy magnitude, and locus with goal expectancy. This is in accordance with Tennen et al. (1987) who reported that helplessness (i.e. a perception of low self-efficacy) is characterised by attributing negative results to enduring or stable qualities of the self. Although goal orientation (i.e. the differentiation between learning goals and performance goals; see Dweck, 1986:1040) was not tested directly, except for the one item in section A of the questionnaire, the data shows a definite relationship between self-efficacy, attributions and the dimensionality of attributions, which enables one to differentiate goal orientations.

All three constructs, namely goal orientation, attributions and self-efficacy, were found to be interrelated and measured the same global construct, namely motivation. The expectancy-value paradigm, as used in this research, can thus be accepted as describing motivation adequately. One of the omissions of this research, however, is that anxiety, as the other motivational variable in Pintrich's (1988a) expectancy-value paradigm, was not tested.

Secondly it was found that motivational pattern relates to course choice. It would seem that a student needs to have an adaptive motivational pattern, before he would accept the challenge of a highly conceptual course such as mathematics or private law.

According to Dweck (1986:1047) students with adaptive motivational patterns choose challenging tasks, irrespective of intelligence level, while students with maladaptive motivational patterns choose tasks of an average-to-easy difficulty level. Ethington (1991:65) reported that prior achievement in mathematics did not influence intention to carry on with mathematics in later years. Values and

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Although much research (inter alia Haynes, 1990; Foon, 1988; Wolf & Savickas, 1985) has been aimed at determining the influence of attributions on various aspects of learning, such attributions have been pre-classified into dimensions. Little research, however, has endeavoured to determine whether pre-classification of attributions into dimensions concur with students' personal perceptions of the dimensional properties of attributions. Thus, although a student might attribute failure to ability, normally classified as stable and uncontrollable, the student might perceive ability as variable and controllable, and consequently not suffer such a decrease in self-efficacy, as when he would have perceived it to be stable and uncontrollable.

The student's interpretation of the locus, stability and control of attributions relates to his perception about how competent he is to achieve a specific learning goal. Perceptions about competence are differentiated by two goal orientations, namely a performance orientation or a learning orientation (Dweck, 1986:1040). A student who aims at validating his competence through performance, is described as performance- or ego-oriented, whereas a student who learns in order to become more competent so that he can master learning tasks in a self-regulated manner, is described as learning-, mastery- or task-oriented (Wood et al., 1990:3; Schunk, 1990:6).

Whereas a learning-oriented student feels responsible for success and failure, a performance-oriented student accepts responsibility for success, but not for failure. A performance-oriented student attributes failure to causes which he perceives to be external and uncontrollable, such as environmental factors or the high difficulty level of the task. He attributes success, however, to high ability generally accepted as internal and stable. A learning-oriented student, on the other hand, attributes failure mainly to lack of effort or the wrong learning strategy, which is internal, but unstable and controllable. Success is caused by internal and controllable causes, such as ability or effort (Schunk, 1990:5-7). Performance-oriented students thus manifest the so-called self-serving effect or hedonic bias, which is the tendency to accept responsibility for success, but not for failure, thereby avoiding negative, and strengthening positive judgements about competence (Zaleski, 1988:567; Marsh, 1986).

Kroll (1988) found that task orientation was positively associated with tolerance for ambiguity, thoughtfulness and open-mindedness, whereas performance orientation was negatively related to these variables, as well as to complexity of the task and individualism. Task-oriented strategies were also reported to

expectancy and value perceptions. Performance expectancy predicts mathematics grades, whereas value perceptions predict course enrollment. The differences reported between research done at school and university level can, among others, be attributed to the more competitive atmosphere of school classrooms, in contrast to university classrooms, which are characterized by a less competitive and more individual atmosphere.

The causes to which a student attributes learning results thus influence, and are in turn influenced by, the student's goal orientation and his level of self-efficacy (Schunk, 1990:6; Wood et al., 1990:3).

Although much research has been done on the influence of attributions, self-efficacy and goal orientation on either task choice or academic achievement, little research has been done on the relationships between type of course, motivational variables and academic achievement. This research aimed to identify such relationships and was divided into two studies, namely: (i) to determine whether students' evaluation of the locus, stability and control of their most salient attribution for success and failure, differed between courses of varying conceptual levels, and (ii) to test the hypothesis that there is a relationship between attributional style (i.e. goal orientation), self-efficacy and academic achievement in first-year university courses of different conceptual levels.

## **6.2 METHOD**

### **6.2.1 Subjects**

The total population of first-year students (N=509) enrolled for history (N=62), physical education (N=65), mathematics (N=130) and private law (N=252), at an independent, rural, Afrikaans-speaking university in the Republic of South Africa, were the participants in this study. Student numbers differ in the various statistical analyses performed on the data because some students failed to answer all the questions in each section of the questionnaire. As the number of students with missing data is low, it can be accepted that the data of the remaining students is still representative of the total population for each course.

attributions of university students, the means out of a possible 20, standard deviations (SD) and subscale reliability coefficients (Cronbach alpha,  $r$ ) of the eight subscales, were all computed (table 6.1). The original MAS reliability coefficients appear in brackets.

**TABLE 6.1 Attribution subscales: Means, standard deviations and reliability coefficients**

Subscale	N	Means	SD	r
Success/ability	311	15,19	2,63	0,76 (0,77)
Success/effort	310	14,31	3,42	0,89 (0,79)
Success/environment	311	11,72	2,92	0,74 (0,48)
Success/task dif.	311	12,79	2,79	0,67 (0,39)
Failure/ability	308	09,61	2,88	0,67 (0,63)
Failure/effort	311	11,76	2,94	0,74 (0,66)
Failure/environment	305	10,59	2,73	0,38 (0,48)
Failure/task dif.	308	12,34	2,91	0,67 (0,48)

Section B-1 of the questionnaire was scored by summing each of the four success and each of the four failure attributions. From these eight totals could be determined which of the four attributions were perceived to be the most salient in success and in failure events.

Section B-2, attributional style, was constructed according to Weiner's (1983:534) instructions, Russell's (1982) Causal Dimension Scale and Van Overwalle's (1989) simplification of the Russell-scale. Students were instructed to choose one of the four attributions given for each of the 8 subscales that they perceived to be the most salient determinant of their performances and results. Each of the eight chosen attributions was then rated by students on the dimensions of locus, stability and control. Attributional orientation, which refers to the student's predilection for certain types of attributions, was determined before examining attributional style. The differentiation between attributions was made by allotting 4 to each effort attribution, 3 to ability, 2 to environment and 1 to each task difficulty attribution. The four success scores were totalled to a maximum of 16, as was the four failure scores, to give two variables designated as success-orientation and failure-orientation. Attributional style was determined

section was completed under the guidance of the researcher so that students would know exactly how to answer each section of the questionnaire.

### 6.3 RESULTS

#### Study 1

To determine: (i) which attribution students viewed as the most salient, and (ii) how students evaluated the locus, stability and control of this attribution, the means (out of a possible 20) and standard deviations (SD) for each attribution and dimension (for success and failure) were computed (SAS Institute, Inc. 1985) for the total group of students and for each course group separately (table 6.2).

**TABLE 6.2 Attributional pattern and style for each course**

	Attributional pattern		Attributional style		
Course	Attributions for Success		Locus for Success	Stability	Control
Hist.	Ability	-	Internal	Variable	Controllable
Phys.ed.	Ability	-	Internal	Variable	Uncontrollable
Math.	Ability	-	Internal	Variable	Uncontrollable
Law		Effort	Internal	Variable	Controllable
Mean	15	16	15	13	13
SD	2,63	3,42	3,16	2,99	3,18
Course	Attributions for Failure		Locus for Failure	Stability	Control
Hist.	-	Effort	Internal	Variable	Controllable
Phys.ed.	Task	-	External	Variable	Uncontrollable
Math.	Task	-	Internal	Variable	Uncontrollable
Law	Task	-	Internal	Variable	Controllable
Mean	12	12	14	11	13
SD	2,91	2,94	3,00	2,79	2,95

about the locus, stability and control of ability, effort and task difficulty. The conclusion was reached that research aimed at identifying the attributional patterns and styles of students, is not reliable, unless the personal perceptions that students have of the dimensional qualities of attributions are taken into consideration.

Students were next grouped into adaptive and maladaptive attributional styles (table 6.3). Adaptive refers to the perception that the cause of success is internal and controllable and that of failure is variable, but controllable. All students who did not manifest this style were classified as having a maladaptive attributional style.

**TABLE 6.3 Percentage of students with adaptive versus maladaptive attributional styles**

	Attributional style		
	N	Adaptive	Maladaptive
History	57	47%	53%
Physical education	61	28%	72%
Mathematics	122	35%	65%
Private law	233	36%	64%
Contingency coefficient: Effect size	0,14 0,1		

The effect size was small (cf. Cohen, 1977:223-227 for effect size as an indication of educational significance), implying that the attributional styles between courses did not differ significantly. History had the highest percentage (47%) of students with adaptive attributional styles, followed by private law (36%), mathematics (35%) and lastly physical education (28%). When the semester-test scores of students with adaptive attributional styles were contrasted between courses (table 6.4), only the history students achieved in accordance with their attributional styles.

expectancy (tables 6.5 and 6.6) for private law students ( $F(1,233) = 16,43$ ;  $p < 0,01$ ), one can deduce that students with high self-efficacy will have higher expectancy of success than students with low self-efficacy.

**TABLE 6.5 Private law: Two-way analysis of variance with factors attributional style and self-efficacy on expectancy**

Source	DF	Type III SS	F Value	PR > F
Attributional style	1	2,202	0,83	0,363
Self-efficacy	1	43,564	16,43	0,0001
Style x SE	1	0,694	0,26	0,609

**TABLE 6.6 Effect size of self-efficacy on expectancy**

	N	Mean	SD	d (effect)
Low self-efficacy	85	10,56	1,66	0,60
High self-efficacy	139	11,54	1,60	

## 6.4 DISCUSSION

The research was aimed at determining whether the expectancy-value theory is effective in explaining the motivational variables that influence the academic achievement of university students. According to Pintrich (1988:75) expectancy relates to attributional pattern and level of self-efficacy, while value relates to goal expectancy which can be deduced from attributional style (Schunk, 1990:4-7).

Analyses of the attributional patterns and styles of students from four university courses, led to the conclusion that attributional styles do not differ between courses of varying conceptual levels. Although students were able to evaluate the cause of their performance, and seemed to be able to rate the locus, stability and control of the cause, no effects were found for attributional style on expectancy of success. The only effect was for self-efficacy on expectancy for private law students. Students were judged to be either unable to rate the locus,

is able to judge the conceptual or difficulty level of a course, and to compare it to his self-perceived competence to master the task, would be better able to make a sensible course choice. This might prevent students who doubt their competence to perform highly conceptual tasks, such as those that occur in mathematics and private law, from enrolling for such courses. Instruction in metacognitive techniques of self-appraisal may also empower more students to attribute failure to causes that they can control, such as lack of effort or poor learning strategies, and prevent them from becoming selfhelpless by attributing failure to uncontrollable causes.

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## CHAPTER 7

### CONCLUSIONS AND RECOMMENDATIONS

#### 7.1 INTRODUCTION

The aim with this study was to determine: (i) whether there were differences in the motivational patterns of students enrolled for first-year university courses that differ in level of conceptuality, and (ii) whether attributional style and level of self-efficacy had any effect on students' academic achievement. According to the expectancy-value theory, a student's motivational pattern consists of the interaction between attributions, attributional dimensions, from which attributional style is inferred, self-efficacy and goal expectancy. In order to identify motivational pattern, the relationships between attributions, dimensions, self-efficacy and expectancy were determined first.

The study was reported in the form of five articles, of which the first three dealt with the literature study (cf. Chapters 2, 3 and 4), and the last two (cf. Chapters 5 and 6) with a report of the empirical research. In the following paragraphs a summary and conclusions are given of: (i) the most important aspects described in each of the three articles that dealt with the literature study (cf. Par. 7.2), and (ii) the empirical research (cf. Par. 7.3). The limitations of the study are stated in paragraph 7.4 and recommendations for further research are made (cf. Par. 7.5).

#### 7.2 SUMMARY AND CONCLUSIONS OF THE LITERATURE STUDY

##### 7.2.1 Motivation in learning context: A process-oriented approach

In chapter 2, the first of two articles that dealt with the theoretical basis of motivation, motivation was discussed in the context of learning. After defining learning (cf. Par. 2.2), it was related to two dichotomous goals, namely, (i) learning through own effort and personal experience, the so-called processes of learning (how one learns), and (ii) learning through the acquisition of a set body of information or content, the so-called outcomes of learning (what one learns).

## **7.2.2 Motivation to learn: The role of self-evaluation, self-efficacy, goal orientation and attributions**

In the second article (cf. Chapter 3) motivation was discussed from a process-oriented perspective and placed in the context of self-evaluation. Since self-evaluation occurs through cognitive capabilities, the capabilities of symbolizing, forethought, vicarious deduction, self-regulation and self-reflectivity, were described first (cf. Par. 3.2.1). The mechanism of self-evaluation was explored next, and was found to lead to beliefs about self-efficacy, the goal of learning and the causes to which learning results are attributed (cf. Par. 3.2.2). The following paragraphs were devoted to a description of the influence of self-evaluation on self-efficacy (cf. Par. 3.3), goal orientation (cf. Par. 3.4) and attributions (cf. Par. 3.5) and their interactive effects on the student's motivation to learn.

The educational implications (cf. Par. 3.6) of self-evaluation are the following:

- \* a student clarifies his reasons for engaging in a learning task and judges his abilities, effort and learning outcomes in the context of the type and difficulty level of the task
- \* realistic knowledge of goals and attributions stimulates self-efficacy, self-control, self-confidence and the acceptance of responsibility for learning
- \* attributions, self-efficacy and goal orientation are domain-specific and differ in accordance with the type and difficulty level of the course and learning tasks
- \* emphasis on ability and academic achievement leads to a performance orientation and stimulates the choice of easy tasks and courses, and avoidance of difficult ones
- \* instruction and feedback must be aimed at improving competence, and not knowledge
- \* a process-oriented approach to instruction stimulates the metacognitive skills and strategies necessary for self-evaluation

- \* no criticism can be levelled at the way in which the process-oriented approach describes how the student gains self-knowledge and control from personal performance or social interactions (cf. Par. 4.5.3)
- \* a process-oriented approach to motivation is acceptable to Christian education (cf. Par. 4.5.4), given learning behaviour is interpreted in the light of the Word of God, Who endowed each man with his own merits and limitations

## **7.3 SUMMARY AND CONCLUSIONS OF THE EMPIRICAL RESEARCH**

### **7.3.1 Summary of the method of research**

All the students enrolled for the first-year courses in history, physical education, mathematics and private law formed the population used in the empirical research (cf. Par. 5.3.1). Due to the lack of an instrument, a questionnaire was constructed to measure self-efficacy, attributional choice and attributional style, from which goal orientation was derived (cf. Addendums A and B).

To determine whether the motivational patterns of students enrolled for courses varying in conceptual level differed, four university courses of different conceptual levels were chosen. The conceptual levels of history and physical education were classified as low, and those of private law and mathematics as high (cf. Par. 3 of Addendum A). Academic achievement was taken to be the student's score on the April semester-test.

Correlational, factor, frequency and variance analyses (ANOVA) were used to analyse the data.

### **7.3.2 Summary and conclusions of results**

The results and conclusions are given in accordance with the hypotheses.

- \* whether he perceives the locus of effort as internal or external, and as controllable or not, before attributing either success or failure to effort
- \* the locus and control of attributions, for both success and failure, before he can effectively decide on the causes of performance

**7.3.2.2 Motivational pattern (i.e. adaptive versus maladaptive) differs in accordance with course type (i.e. highly conceptual versus less conceptual)**

Motivational pattern was determined by means of a factor analysis (cf. Table 5.4) and differentiated into adaptive versus maladaptive motivational patterns. Courses were divided into highly conceptual versus less conceptual courses, in accordance with their content and evaluation methods used (cf. Par. 3 of Addendum A). The difference between the motivational patterns of students enrolled for more versus less conceptual courses, was determined by means of a frequency analysis (cf. Table 5.5) and the effect size of the difference was determined.

The following conclusions were drawn:

- \* a higher percentage of students enrolled for highly conceptual courses have adaptive, rather than maladaptive motivational patterns
- \* a higher percentage of students enrolled for less conceptual courses have maladaptive, rather than adaptive motivational patterns
- \* the difference between motivational pattern and course type is educationally very significant, and implies that motivational pattern can be used as an indicator when advising students on course choice

**7.3.2.3 There is an interaction between attributional style and academic achievement in courses of different conceptual levels**

Attributional style was computed by means of frequency analyses, after which a differentiation was made between students with adaptive and maladaptive attributional styles, based on the locus, stability and control of attributions (cf.

#### **7.3.2.4 General overview of the research results**

Educationally significant relationships were found between goal expectancy, attributional choice, attributional style and self-efficacy (cf. Table 5.3). A difference was found between the motivational patterns of students, with more students from the highly conceptual courses manifesting an adaptive motivational pattern, than students from the less conceptual courses (cf. Table 5.5). No difference, however, was found between the attributional styles of students enrolled for highly conceptual courses versus less conceptual courses (cf. Table 6.2). Lastly, attributional style and self-efficacy showed no effects on academic achievement of students enrolled for courses that differ in level of conceptuality.

The following general conclusions, based on the research results, were thus reached:

- \* when developing a test to measure motivation, the test should include goal expectancy, attributional choice, attributional style and self-efficacy
- \* motivational pattern can be used as a screening mechanism for first-year university students who have difficulty with course choice
- \* as motivational pattern and attributional style, especially for failure, differ between courses, the measuring instrument must be domain-specific
- \* achievement in highly conceptual courses is more susceptible to motivational influences than achievement in less conceptual course
- \* students were unable to evaluate the locus, stability and control of attributions effectively, since their attributional styles did not concur with their perceptions of self-efficacy
- \* students need to be instructed in metacognitive skills necessary for self-evaluation

#### **7.4 LIMITATIONS OF THE EMPIRICAL RESEARCH**

The limitations of the empirical research relate to the nature of the measuring instrument, scheduling of the empirical research, and statistical analyses performed on the data.

- \* the planning of instructional programmes aimed at improving the metacognitive strategies and skills necessary for self-evaluation
- \* identification of gender differences in self-efficacy, attributional pattern and style, and motivation
- \* cross-cultural research aimed at identifying whether any differences occur in level of self-efficacy, attributional style and motivational pattern, between students of different ethnic groups

## **7.6 FINAL REMARK**

Motivation relates to self-knowledge and control over personal behaviour. Since man acts in response to God's call, he necessarily needs to know his own potential and competence to fulfill his vocation. Self-evaluation in the light of the Scripture, from which man learns who he is and how he ought to act, is thus of the utmost importance for instigating and sustaining learning.

To attain these aims, the following hypotheses were tested:

Hypothesis 1: There is a relationship between self-efficacy, goal expectancy<sup>1</sup>, attributional choice and attributional style<sup>2</sup> of first-year university students

Hypothesis 2: Motivational patterns differ in accordance with first-year courses of varying conceptual levels

Hypothesis 3: Attributional styles differ in accordance with first-year courses of varying conceptual levels

Hypothesis 4: The influence of attributional style and self-efficacy on academic achievement differs between courses of varying conceptual levels

### 3. RATIONALE FOR SELECTION OF COURSES

Four university courses, namely history, physical education, mathematics and private law, were chosen, based on the difference between the courses in content-domain and information-processing required. Knowledge which is gained from learning-from-instruction is based on the content of information presented in class and in textbooks and on the student's cognitive structuring of such information (Pintrich, 1988a:66). Information-processing thus interacts with content to form knowledge, and knowledge formation, therefore, has an active nature (Jacob, 1982:224 and 231). Attention will first be given to the differences between the contents of courses and then to differences in information-processing.

According to Piaget (quoted by Jacob, 1982:227-228) courses differ in accordance with their *content*, which, in part, influences instructional method and the processing of information by the student. The content of history (and in this research also physical education), for instance, is based on adult decision-making or collective opinion, relates to conventions, and can be taught by using passive methods of transmission of knowledge. Mathematical content and logic (which

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<sup>1</sup>In this hypothesis goals denote goal-expectancy, namely the mark the student expects to gain for the semester test.

<sup>2</sup>Attributional choice refers to the preference of specific attributions; attributional style refers to the student's perception of the locus, stability and control of the attributions that he prefers. Attributional choice is necessary to determine attributional style.

themselves more to memorisation based on a surface approach, than the contents of the other two courses. As the contents of private law and mathematics need to be processed to a deep level, such processing depends crucially on prerequisite higher-order cognitive skills and knowledge (Entwistle, 1988:45).

Due to a lack of descriptive concepts to typify the two groups, history and physical education were termed courses of a low conceptual level, while private law and mathematics were termed highly conceptual. Level of conceptuality, therefore, refers to the level of cognitive processing of information through cognitive skills and strategies, as related to the type of course content.

In line with Entwistle (1988:45) it must be reiterated that students need both surface and deep processing to master university courses, as all courses consist in part of verbatim knowledge (such as definitions, models or rules), and knowledge that needs comprehension. Some courses only lend themselves more to surface processing than others. To perform some of the history and physical education tasks, students must use higher order cognitive skills. Students can, however, memorise much of the content.

#### **4. SUBJECTS**

The total population of first-year students (N=509) enrolled in four different courses at an independent, rural, Afrikaans-speaking university in the Republic of South Africa were the participants in this study. The number, sex and degree for which the student is enrolled (i.e. B.A., B.Sc., etc.) are given per course in table 1.

As some students failed to answer all the questions in each of the sections of the questionnaire, student numbers differ in the various statistical analyses performed on the data. The computer-programmes used for the statistical analyses of the data are, however, of such a nature that in case of missing data the full range of data for the specific student is ignored. As the number of students with missing data is low, it can be accepted that the data of the remaining students is still representative of the total population for each course-group.

### **5.1.3 Attributional choice variables:**

(v) Ability attributions for success, (vi) Effort attributions for success, (vii) Environment attributions for success, and (viii) Task-difficulty attributions for success.

(ix) Ability attributions for failure, (x) Effort attributions for failure, (xi) Environment attributions for failure, and (xii) Task-difficulty attributions for failure.

### **5.1.4 Attributional style variables:**

(xiii) Locus of attributions for success, (xiv) Stability of attributions for success, (xv) Control of attributions for success and (xvi) Attributional orientation to success.

(xvii) Locus of attributions for failure, (xviii) Stability of attributions for failure, (xix) Control of attributions for failure and (xx) Attributional orientation to failure.

## **5.2 Dependent variables**

For hypotheses two (cf. Chapter 5) and three (cf. Chapter 6) the dependent variable is type of course, differentiating between courses of a high and a low conceptual level. For hypothesis four (cf. Chapter 6) the dependent variable is academic achievement as measured by a test that was written during the first semester.

## **6. MEASURING INSTRUMENT**

As a variety of motivational variables can influence learning (and indirectly, also academic achievement), the rationale for the inclusion of the variables (stated in paragraph 5) in the motivational questionnaire will be given first.

## 6.2 Description of the questionnaire

### 6.2.1 Section A

This section of the questionnaire measures self-efficacy magnitude, self-efficacy strength, goal expectancy and goal orientation.

Section A was constructed according to a self-efficacy scale used by Wood and Locke (1987) to test the relationship between self-efficacy, goal expectancy and academic achievement at college level. The scale consists of the following seven learning task areas identified by Wood and Locke (1987:1015) as relevant to the examination of learning skills and motivation:

- (i) *Class concentration* which denotes the length of time during a class period a student feels that he can concentrate exclusively on instruction and understanding of course material
- (ii) *Memorization* which denotes the proportion of facts and concepts of the course material that the student feels he can memorize during learning and remember, or recall, on demand
- (iii) *Understanding* which refers to the proportion of facts, concepts, relationships and arguments the student perceives as understandable when presented in lectures, tutorials or course materials such as textbooks
- (iv) *Discriminating concepts* which denotes the proportion of time during a lecture or while learning, that the student feels he can discriminate between more and less important facts, concepts, relationships and arguments
- (v) *Explaining* which refers to the proportion of facts, concepts, relationships and arguments the student thinks he will be able to explain to others so that they will understand them
- (vi) *Note-taking* which refers to the proportion of time during a lecture, tutorial or while learning course material, that the student feels he is able to make comprehensible notes focusing on, clarifying and relating key facts, concepts and arguments

### EXAMPLE 1 Self-efficacy sub-scale with 3 options

*Discrimination.* For which proportion of time that the instructor explains the work, or that you are studying, can you discriminate between more and less important facts, concepts and relationships?

	Yes	Confidence				
1. I can discriminate the importance of work for 40% or less of the time.	1	5	4	3	2	1
2. I can discriminate the importance of work for about 60% of the time.	2	5	4	3	2	1
3. I can discriminate the importance of work for 80% or more of the time.	3	5	4	3	2	1

An eighth subscale, consisting of four highly intercorrelated items, measuring *goal expectancy* was included in accordance with Wood and Locke (1987:1017). The four items were: (1) the grade the student hoped to get for the test; (2) the minimum grade he would be satisfied with; (3) the grade he expected to get; and (4) the grade he had actually tried for in the test. (The internal consistency reliability coefficient of the four items for this study was 0,89). All goal statements were reported in percentages and were converted to a mean of 20 to bring it in line with the self-efficacy measures. An additional one-item subscale, namely: Do you learn in order to understand the work without thinking of a specific grade? (yes or no), was added to identify *goal orientation*. This item was added, as Dweck (1986:1040) states that an adaptive motivational pattern can be typified as learning for the sake of gaining competence, and not a specific grade.

#### 6.2.2 Section B

Section B of the questionnaire was aimed at determining how the student views the causes of success and failure of his learning performances, as well as his perceptions of the locus, stability and control of the causes (i.e. attributional style). This section was therefore divided into two parts, namely B-1 measuring attributional choice, and B-2 measuring attributional style.

B-1 is based on a modification of the Mathematics Attribution Scale (MAS) constructed by Fennema, Wolleat and Pedro (1979). The scale was modified

You gained the marks because:

- |    |   |   |   |   |   |   |
|----|---|---|---|---|---|---|
| a. | The class tests were easy                       | 5 | 4 | 3 | 2 | 1 |
| b. | You spent much time in preparing for the tests. | 5 | 4 | 3 | 2 | 1 |
| c. | The lecturer explained the work very well.      | 5 | 4 | 3 | 2 | 1 |
| d. | You have a special aptitude for this subject.   | 5 | 4 | 3 | 2 | 1 |

In order to determine whether all the subscales of the modified Mathematics Attribution Scale (MAS) were salient as attributions of university students, the means (out of a possible 20), standard deviations (SD) and subscale reliability coefficients (Cronbach alpha;  $r$ ) of the eight subscales were all computed and are given in table 2.

**TABLE 2 Attribution subscales: Means, standard deviations and reliability coefficients**

Subscale	N	Mean	SD	$r$
Success/ability	311	15,19	2,63	0,76 (0,77)
Success/effort	310	14,31	3,42	0,89 (0,79)
Success/environment	311	11,72	2,92	0,74 (0,48)
Success/task dif.	311	12,79	2,79	0,67 (0,39)
Failure/ability	308	09,61	2,88	0,67 (0,63)
Failure/effort	311	11,76	2,94	0,74 (0,66)
Failure/environment	305	10,59	2,73	0,38 (0,48)
Failure/task dif.	308	12,34	2,91	0,67 (0,48)

The fact that the means of all the subscales are nearly 10, or more, out of a possible 20, implies that all the subscales were well used as possible explanations of success and failure. As university students have already ascertained their ability to perform by passing matric, it can explain the low mean of failure attributed to ability. The means for success/ability and success/effort are higher, and the rest lower, than those reported by Fennema et al. (1979), when testing the MAS on secondary school students. The discrepancy is probably due to the academic level of the students in this study. The reliability coefficients are, apart from that of failure/environment, all higher than those reported by Fennema et

The dimensional scaling was done on a 5-point Likert-scale: 5 being most internal, stable and controllable while 1 is most external, unstable and uncontrollable; 3 signifies indecision. This section of the questionnaire has eight subscales (i.e. the eight chosen attributions) of which four designate attributions for success events and four attributions for failure events. Each of the subscales has three items, namely locus, stability and control.

Before the student's attributional style could be determined, his attributional orientation first had to be determined. Attributional orientation refers to the student's predilection for certain types of attributions. The differentiation between attributions was made by allotting 4 to each effort attribution, 3 to each ability attribution, 2 to each environment attribution and 1 to each task difficulty attribution. The four success scores were totalled to a maximum of 16, as was the four failure scores, to give two variables designated as the student's attributional orientation to success (*success-orientation*) and to failure (*failure-orientation*).

Attributional style was then determined by summing respectively locus of causality, stability and control over the four success events, and then over the four failure events, giving six totals, designating *locus of causality for success attributions*, *stability for success attributions*, *control for success attributions*, *locus of causality for failure attributions*, *stability for failure attributions* and *control for failure attributions*. The internal reliability coefficient of these six variables was 0,60. Attributional style was determined by identifying the pattern of dimensions for success and failure events.

## 7. PROCEDURE

To formulate the questionnaire congruent with course demands (see paragraph 3), an analysis of the study guides compiled for the instruction of the first semester courses in history, physical education, private law and mathematics, was done. Personal interviews were also conducted with the lecturers of the private law and history courses to gain additional information of course demands.

After the questionnaire had been constructed, a pilot study was done on twenty-five first-year students from the specified courses to ascertain their comprehension of the questionnaire (which was set in Afrikaans), and the length of time it would take to complete. It was found that only students who were

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## **ADDENDUM B**

Although the questionnaires for history, physical education, mathematics and private law were not similar, they differed only in the course-specific terminology used. Therefore an Afrikaans version of the questionnaire for the history students, and an English version of the questionnaire for the mathematics students are given.

**MOTIVATIONAL QUESTIONNAIRE, MATH (WSK III): ALGEBRA (English version)**

THE FOLLOWING QUESTIONS ARE AIMED AT TESTING YOUR MOTIVATION TO LEARN ALGEBRA. AS THE QUESTIONS HAVE NO RIGHT OR WRONG ANSWERS, PLEASE ANSWER THE QUESTIONS AS TRUTHFULLY AS POSSIBLE.

**SECTION A**

**INSTRUCTIONS**

Read question 1 and its three possible answers (a, b en c) that are given. Identify under YES the answer that relates best to you. If you think that you can give attention and concentrate for only 40% of the time, cross square 1 under column designated as YES. If you think you can give attention and concentrate for about 60% of the time, then cross square 2 under YES, and if you think you can give attention and concentrate for 80% or more of the time, cross square 3 under YES.

Once you have decided on the length of time you are mostly able to give attention and concentrate, decide how certain you are of your answer by crossing one of the numbers from 1 to 5 under column designated as DEGREE OF CERTAINTY. Use the following scale to designate how certain you are:

5                      4                      3                      2                      1  
very certain          certain              don't know        uncertain          very uncertain

**EXAMPLE:** If you think you can concentrate for about half the time a classperiod lasts, choose for question 1 the option that designates your opinion best, namely a. Thus cross square 1 under YES. Now judge how certain you are that you are mostly able to concentrate for about half the time a classperiod lasts. If you are very certain that you have chosen correctly, cross square 5; if you are certain, but not totally, cross square 4; if you can't judge how certain you are, cross square 3; if you are somewhat uncertain about your choice, cross square 2; and if you are very uncertain, cross square 1.

Now answer questions 2 - 7 in the same way. Answer all the questions and don't omit any of the questions.

2.1 For what length of time during a 50-minute classperiod, can you give your undivided attention to the learning content and concentrate on what the lecturer explains, or what is being discussed?

	YES	CERTAINTY
a. I can give attention and concentrate for 40% or less of the time.	1	5 4 3 2 1
b. I can give attention and concentrate for about 60% of the time.	2	5 4 3 2 1
c. I can give attention and concentrate for 80% or more of the time.	3	5 4 3 2 1

2.2 What percentage of the concepts and facts can you memorise when you learn and remember or recall when you are writing a test or exam, or when the lecturer asks you a question?

# MOTIVERINGSVRAELYS, MBW III, Motoriese Leer.

DIE VOLGENDE VRAE IS GERIG OP JOU MOTIVERING VIR MENSLIKE BEWEGINGSKUNDE. DIE VRAE HET GEEN REGTE OF VERKEERDE ANTWOORDE NIE. BEANTWOORD DUS DIE VRAE SO EERLIK AS MOONTLIK.

## AFDELING A

### INSTRUKSIES

Lees vraag 1 en die drie moontlike antwoorde (a, b en c) wat gegee word. Maak nou 'n kruisie onder JA by die moontlike antwoord wat jy dink die meeste op jou betrekking het. As jy dink dat jy slegs vir 40% van die tyd kan aandag gee en konsentreer, maak jy 'n kruisie in blokkie nommer 1 onder JA. As jy dink jy kan vir ongeveer 60% van die tyd aandag gee en konsentreer, maak jy 'n kruisie in blokkie nommer 2 onder JA of as jy dink dat jy vir 80% of meer van die tyd aandag gee en konsentreer, maak jy 'n kruisie in blokkie nommer 3 onder JA.

As jy klaar besluit het vir hoe lank jy kan aandag gee en konsentreer, moet jy aandui hoe seker jy is dat jy wel solank kan aandag gee en konsentreer deur in die blokkies onder MATE VAN SEKERHEID een van die syfers 1 - 5 deur te kruis. Gebruik die volgende skaal om aan te dui hoe seker jy is:

5	4	3	2	1
baie seker	seker	weet nie	onseker	baie onseker

**VOORBEELD:** As jy dink dat jy vir stegs die helfte van die klasperiode kan konsentreer, kies jy by vraag 1 die opsie wat jou opinie die naaste en beste weergee, naamlik a. Trek dus 'n kruisie onder JA in blokkie 1. Hierna skat jy hoe seker jy is dat jy net vir die helfte van die periodetyd sal kan konsentreer. As jy baie seker is dat jy reg gekies het, trek 'n kruisie deur 5; as jy seker is, maar nie heeltemal nie, trek 'n kruisie deur 4; as jy nie weet of jy seker is nie, trek 'n kruisie deur 3; as jy onseker is oor jou keuse, trek 'n kruisie deur 2; en as jy baie onseker is, trek 'n kruisie deur 1.

Beantwoord nou vrae 2 - 8 op dieselfde wyse. Beantwoord al die vrae en moenie een vraag oorslaan nie.

1. Vir hoe lank kan jy, tydens 'n 50-minute klasperiode, jou volle aandag aan die leerstof gee en konsentreer op dit wat die dosent verduidelik, of wat bespreek word?

- a. Ek kan vir 40% of minder van die periodetyd aandag gee en konsentreer.  
b. Ek kan vir ongeveer 60% van die periodetyd aandag gee en konsentreer.  
c. Ek kan vir 80% of meer van die periodetyd aandag gee en konsentreer.

Ja	Mate van sekerheid
<input type="checkbox"/> 1	
<input type="checkbox"/> 2	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1 (15)
<input type="checkbox"/> 3	(14)

2. Watter gedeelte van die begrippe en afrigtingsmodelle kan jy memoriseer wanneer jy leer en weer onthou of herroep wanneer jy 'n toets of eksamen skryf, of as die dosent jou 'n vraag vra?

- a. Ek kan 40% of minder van die begrippe en modelle memoriseer en weer herroep.  
b. Ek kan ongeveer 60% van die begrippe en modelle memoriseer en weer herroep.  
c. Ek kan 80% of meer van die begrippe en modelle memoriseer en weer herroep.

Ja	Mate van sekerheid
<input type="checkbox"/> 1	
<input type="checkbox"/> 2	<input type="checkbox"/> 5 <input type="checkbox"/> 4 <input type="checkbox"/> 3 <input type="checkbox"/> 2 <input type="checkbox"/> 1 (17)
<input type="checkbox"/> 3	(16)

3. Watter gedeelte van die feite, begrippe en verbande wat die dosent verduidelik, of wat in die tutoriaalklas bespreek word, of wat jy leer, verstaan jy regtig?

- |  |   |   |   |   |   |   |
|--|---|---|---|---|---|---|
| a. I can concentrate exclusively on answering questions for 50% or less of the time. | 1 | 5 | 4 | 3 | 2 | 1 |
| b. I can concentrate exclusively on answering questions for 70% or more of the time. | 2 | 5 | 4 | 3 | 2 | 1 |

2.8 Answer the following four questions by giving a percentage between 0 and 100.

- What percentage do you hope to attain in the semester test?
- What is the minimum percentage you will be satisfied with?
- What percentage do you expect for the test?
- For what percentage did you aim?
- Do you learn in order to master the work without aiming for a specific percentage?  
Yes or No

## SECTION B

### INSTRUCTIONS

You are about to read eight suppositions about the Algebra-section of Mathematics I, WSK III, pertaining to: (i) the manner in which the course is taught; (ii) the manner in which you must answer or learn the objectives that are described in the study-guide; (iii) class-test scores and (iv) the manner in which you must execute class- and study-assignments. Remember these are suppositions. You must interpret the suppositions and react as though they were true. For each supposition four possible causes, serving as explanations of the supposition, are given. You must decide to what extent you agree with each of the causes. Each supposition and the possible causes are grouped together: the supposition is given first, followed by the four causes.

READ supposition 1 and the four possible causes (a, b, c and d), serving as explanations, very carefully.

Supposition 1: FOR THE CLASS-TESTS YOU HAVE WRITTEN SO FAR THIS SEMESTER YOU HAVE ATTAINED THE GRADES THAT YOU WANTED.

You attained the grades you wanted, because:

- |   |   |   |   |   |   |
|---|---|---|---|---|---|
| a. The class-tests were easy.                               | 5 | 4 | 3 | 2 | 1 |
| b. You spent a lot of time each day studying and preparing. | 5 | 4 | 3 | 2 | 1 |
| c. The lecturer is good at explaining Algebra.              | 5 | 4 | 3 | 2 | 1 |
| d. You have a special aptitude for Algebra.                 | 5 | 4 | 3 | 2 | 1 |

Now DECIDE how much you agree with EACH of the causes by crossing the applicable number that reflects your decision best. Use the following scale:

5	4	3	2	1
strongly agree	agree	undecided	disagree	strongly disagree

If you totally disagree with a as a possible cause of the supposition, cross 1; if you just disagree with a, cross 2; if you are uncertain whether you agree or not, cross 3; if you agree, but are not absolutely certain, cross 4; and if you agree wholeheartedly

e. Leer jy om die werk te verstaan sonder om aan 'n spesifieke punt te dink?

Ja	Nee
1	2

(36)

## AFDELING B

### INSTRUKSIES

Jy gaan agt veronderstellings oor die Menslike Bewegingskunde I, die afdeling Motoriese Leer, lees wat betrekking het op:

- (i) die wyse waarop die kursus onderrig word;
- (ii) die wyse waarop jy die doelwille wat in die studiegids beskryf is, moet uitwerk, beantwoord of leer;
- (iii) jou klastoetspunte en
- (iv) die wyse waarop jy jou klas- en studie-opdragte moet uitvoer.

Onthou dit is veronderstellings. Jy moet die veronderstellings interpreteer en daarop reageer asof dit werklik met jou gebeur het. By elke veronderstelling word vier moontlike redes, wat as verklaring van die veronderstelling dien, gegee. Jy moet besluit in hoe 'n mate jy met elkeen van die redes saamstem. Elke veronderstelling en die moontlike redes is saamgegroeper: die veronderstelling word eers gegee, en dan gevolg deur die vier redes.

LEES veronderstelling 1 en die vier moontlike redes (a, b, c en d) wat as verklaring van die veronderstelling kan dien, aandagtig deur.

**Veronderstelling 1: JY HET TOT DUSVER HIERDIE SEMESTER DIE PUNTE WAT JY GRAAG VIR JOU KLAS-TOETSE WOU GEHAD HET, GEKRY.**

**Verklarings:** Jy het die punte wat jy graag wou gehad het, gekry, want:

- a. Die klastoets was maklik.
- b. Jy het elke dag baie tyd aan voorbereiding spandeer.
- c. Die dosent het die werk baie goed verduidelik.
- d. Jy het 'n besondere aanleg vir hierdie tipe vak.

5	4	3	2	1	(37)
5	4	3	2	1	(38)
5	4	3	2	1	(39)
5	4	3	2	1	(40)

BESLUIT nou in welke mate jy met ELKEEN van die redes saamstem deur 'n kruisie te trek in die toepaslike blokkie regs wat die syfer, wat jou gevoel die beste weergee, bevat. Gebruik die volgende skaal:

5	4	3	2	1
stem baie saam	stem saam	onseker	verskil	verskil baie

As jy glad nie met rede a as 'n moontlike verklaring van die veronderstelling saamstem nie, trek 'n kruisie deur 1; as jy verskil met rede a, trek 'n kruisie deur 2; as jy onseker is of jy saamstem of verskil, trek 'n kruisie deur 3; as jy wel saamstem, maar nie heeltemal seker is nie, trek 'n kruisie deur 4; en as jy heeltemal met rede a as verklaring van die eerste veronderstelling saamstem, trek 'n kruisie deur 5. Gaan nou aan met rede b van die eerste veronderstelling en besluit in hoe 'n mate jy met hierdie rede as 'n moontlike verklaring van die eerste veronderstelling saamstem. Doen so ook met redes c en d.

Dink nou oor al vier die redes wat betrekking het op die eerste veronderstelling. Besluit watter een van die vier redes die beste verklaring vir die eerste veronderstelling bied, en trek 'n kruisie deur die nommer in die blokkie links van hierdie rede.

- |   |   |
|---|---|
| 1 | a. Die klastoets was maklik.                            |
| 2 | b. Jy het elke dag baie tyd aan voorbereiding spandeer. |
| 3 | c. Die dosent het die werk baie goed verduidelik.       |
| 4 | d. Jy het 'n besondere aanleg vir hierdie tipe vak.     |

(41)

Now do the same with suppositions II to VIII and don't omit any of the causes of the suppositions. Remember: To ascertain that you remember the scales, a loose page containing the scales, has been inserted at the back of the questionnaire. Remove the page now.

**II. SUPPOSE YOU HAD DIFFICULTY DOING SOME OF THE DAILY ASSIGNMENTS SPECIFIED AS HOMEWORK.**

You couldn't do the assignments, because:

a. There was no time to get help from the lecturer or a fellow student.	5 4 3 2 1
b. You don't think in the logical way that math requires.	5 4 3 2 1
c. You didn't take time to consult the examples that are given in the textbook.	5 4 3 2 1
d. You only experienced problems with the more difficult assignments.	5 4 3 2 1

INTERNAL	5 4 3 2 1	EXTERNAL
STABLE	5 4 3 2 1	UNSTABLE
CONTROLLABLE	5 4 3 2 1	UNCONTROLLABLE

**III SUPPOSE YOU HAVE BEEN UNABLE TO COMPLETE SOME OF THE CLASS ASSIGNMENTS IN THE SAME TIME AS MOST OF YOUR FELLOW STUDENTS.**

You've been unable to complete the class assignments in the same time as fellow students, because:

a. You haven't spent much time on the assignments during classperiods.	5 4 3 2 1
b. Students sitting around you didn't pay attention.	5 4 3 2 1
c. You don't have enough insight to solve math problems as fast as others.	5 4 3 2 1
d. The assignments have been difficult.	5 4 3 2 1

INTERNAL	5 4 3 2 1	EXTERNAL
STABLE	5 4 3 2 1	UNSTABLE
CONTROLLABLE	5 4 3 2 1	UNCONTROLLABLE

**IV SUPPOSE YOU HAVE BEEN ABLE TO COMPLETE YOUR LAST FEW ASSIGNMENTS EASILY.**

You've been able to complete the last few assignments easily, because:

INTERN

5	4	3	2	1
5	4	3	2	1
5	4	3	2	1

EKSTERN (50)

STABIEL

ONSTABIEL (51)

BEHEERBAAR

ONBEHEERBAAR (52)

### III VERONDERSTEL JY KON SOMS NIE DIE DOELWITTE IN DIESELFDE TYD AS DIE MEESTE VAN JOU MEDE-STUDENTE VERSTAAN EN TOEPAS NIE.

Jy kon nie die doelwitte in dieselfde tyd as jou mede-studente verstaan en toepas nie, want:

1	a	Jy het nie genoeg geleer nie omdat jou vriende jou gepla het.	5	4	3	2	1	(54)
2	b	Die dosent het te min tyd aan hierdie afdeling van die werk spandeer.	5	4	3	2	1	(55)
3	c	Jy het nie genoeg insig om die doelwitte in die beskikbare tyd uit te werk en toe te pas nie.	5	4	3	2	1	(56)
4	d	Die doelwitte was moeilik want jy moes self gevolgtrekkings oor loepassings maak.	5	4	3	2	1	(57)

(53)

INTERN

5	4	3	2	1
5	4	3	2	1
5	4	3	2	1

EKSTERN (58)

STABIEL

ONSTABIEL (59)

BEHEERBAAR

ONBEHEERBAAR (60)

### IV VERONDERSTEL JY HET HIERDIE AFDELING VAN DIE KURSUS SE DOELWITTE MAKLIK GELEER EN TOEGEPAS.

Jy kon die doelwitte maklik leer en toepas, want:

1	a	Jy het in hierdie afdeling van die werk belang gestel.	5	4	3	2	1	(62)
2	b	Jy het aan die begin van hierdie afdeling van die werk baie tyd aan voorbereiding spandeer.	5	4	3	2	1	(63)
3	c	Jy het saam met 'n baie hulpvaardige groep medestudente gewerk.	5	4	3	2	1	(64)
4	d	Jy hou van opdragte wat 'n hoë mate van insig vereis.	5	4	3	2	1	(65)

(61)

INTERN

5	4	3	2	1
5	4	3	2	1
5	4	3	2	1

EKSTERN (66)

STABIEL

ONSTABIEL (67)

BEHEERBAAR

ONBEHEERBAAR (68)

### V VERONDERSTEL JY KON SOMMIGE DOELWITTE GLAD NIE IN DIE DIKTAAT OF ANDER VOORGESKREWE OF GERESERVEERDE BRONNE IDENTIFISEER NIE.

Jy kon die betrokke doelwitte nie identifiseer nie, want:

1	a	Hierdie afdeling van Motoriese Leer was baie oninteressant.	5	4	3	2	1	(70)
2	b	Jy het wel probeer, maar moed opgegee omdat jy nie die werk kon verstaan nie.	5	4	3	2	1	(71)
3	c	Die bronne was net so onduidelik soos die dosent se onderrig.	5	4	3	2	1	(72)
4	d	Dis moeilik om uit verskillende bronne te werk om een doelwit te beantwoord.	5	4	3	2	1	(73)

(69)

INTERN

5	4	3	2	1
5	4	3	2	1
5	4	3	2	1

EKSTERN (74)

STABIEL

ONSTABIEL (75)

BEHEERBAAR

ONBEHEERBAAR (76)

**VII SUPPOSE YOU RECEIVED A LOW GRADE ON A CHAPTER TEST.**

You received the low grade, because:

a. It was bad luck that the test was written when you were not well prepared.	5 4 3 2 1
b. You didn't spend enough attention or time to practise how to apply the concepts.	5 4 3 2 1
c. You're not really interested in maths and was consequently not motivated to learn.	5 4 3 2 1
d. There were questions you'd never seen, thought of, or heard about before.	5 4 3 2 1

INTERNAL	5 4 3 2 1	EXTERNAL
STABLE	5 4 3 2 1	UNSTABLE
CONTROLLABLE	5 4 3 2 1	UNCONTROLLABLE

**VIII SUPPOSE YOU ARE MOSTLY ABLE TO APPLY THE BINOMIAL THEOREM CORRECTLY.**

You can apply the binomial theorem correctly, because:

a. The binomial theorem is interesting and relevant to the rest of your study courses.	5 4 3 2 1
b. Initially you approached the lecturer to explain the binomial theorem to you.	5 4 3 2 1
c. When preparing the work, you continuously gave attention to logical relationships and correct methods.	5 4 3 2 1
d. You prefer math tasks that challenge your ability to draw logical conclusions.	5 4 3 2 1

INTERNAL	5 4 3 2 1	EXTERNAL
STABLE	5 4 3 2 1	UNSTABLE
CONTROLLABLE	5 4 3 2 1	UNCONTROLLABLE