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# THE EXPLICIT USE OF PERFORMANCE EXPECTANCY AS A FUNCTION OF SELF-REGULATED LEARNING

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# Abstract

This study examined the effects of making explicit the performance expectancy component of teaching and learning for Grade 8 science students. The performance expectancy used in this research specifically focused on students' predictions of their level of performance on science tests, also referred to as "expectancy statements". This study focused on the following questions:

1. Which variables (predicted score, study time, test rating) best predict student scores?
2. Does the accuracy (the closeness of the student's predicted score to his/her actual score) of students' expectancy statements change with practice?
3. Do students think the use of expectancy statements is helpful in improving their scores?
4. Do students think that the expectancy statements become more accurate with practice?
5. Do students think that their study habits change through the use of expectancy statements?

The data for this study were collected through student classroom files and surveys, and analyzed quantitatively and qualitatively according to the five research questions. The process of quantitative data analysis involved the use of descriptive statistics, ANOVA , and stepwise multiple regression analysis. Qualitatively the data were organized according to recurrent themes.

From this study's findings, it appears that performance expectancy fostered intrinsic motivation, in the form of students' perceptions of improvements in study habits and increased confidence levels. Statistically the relationship between expectancy statements and test scores was positive yet weak.



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# Table of Contents





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# List of Figures and Tables





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CHAPTER ONE

# The Problem

## Background

In educational settings, accurate self-assessment is thought to be especially beneficial when preparing for tests (Kaley & Cloutier, 1984; Pressley & Ghatala, 1989; Nelson-LeGall, Kratzer, Jones, & DeCooke, 1990). To study effectively, students must accurately appraise their knowledge of the to-be-tested material and then allocate study time and cognitive resources accordingly. This appraisal of self-knowledge as a function of score predictions is an especially important component of the "performance expectancy" which is considered to be a part of self-regulated learning.

## Research Problem and Questions

The purpose of this research is to examine the effects of "making explicit the performance expectancy" component of teaching and learning. In this case "making explicit the performance expectancy" means asking students to predict the score they expect to get on the test at the time of writing the test. This predicted score is their "expectancy statement". The following questions guided the research:



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1. Which variables (predicted score, study time, test rating) best predict student scores?

2. Does the accuracy (the closeness of the students' predicted score to his/her actual score) of students expectancy statements change with practice?

3. Do students think the use of expectancy statements is helpful in improving their scores?

4. Do students think that the expectancy statements become more accurate with practice?

5. Do students think that their study habits change through the use of expectancy statements?

## Significance of the Research

Through the performance expectancy process, students can acquire new self-regulatory strategies which are important for improving actual performance on classroom academic tasks (Parsons & Geoff, 1980). Conversely students' self-efficacy beliefs may lead to more use of cognitive strategies such as rehearsal and elaboration. If this is the case, changing teaching methods to incorporate performance expectancy would be desirable and worthwhile.

The study of the effects of an explicit performance expectancy component on one grade eight class has the potential to contribute to the knowledge of self-regulated learning. This research will allow other educators to understand how the use of performance expectancies can influence students. It will also provide a sample of ideas and processes for other educators thinking about using performance expectancy in the classroom. By examining how the ideas and processes can be utilized , this research provides a critique which will enable others to advance

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the implementation of performance expectancies. Finally, by demonstrating how the two holistic concepts of performance expectancy and self-regulated learning are interrelated, this research enables educators to select complementary teaching theories and strategies to enhance their teaching effectiveness.

The potential consequences of this case are many. The increased exposure to performance expectancy and score predictions may have the following effects: an increased comfort and knowledge level among students concerning score predictions, a raised awareness of performance expectancy and self-regulated learning and its potential benefits among educators, and increased school support for this alternate teaching/learning method. If performance expectancy is deemed useful it could result in an evolution of teaching and learning methods which would incorporate performance expectancy. Students may benefit from a new learning model, which could increase teaching effectiveness, resulting in a more knowledgeable and self-directed learner.

## Definitions of Terms

The following are the definitions of terms for this study.

Ability Beliefs: Distinguished conceptually from expectancies for success, ability beliefs focus on present ability, and are defined as the individual's perception of his or her current competence at a given activity.

Achievement: A motive may be conceived of as a disposition to strive for a certain kind of satisfaction in the attainment of a certain class of incentives (Atkinson, 1966).

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Achievement Goals: Achievement goals are the reasons individuals do their academic work, and can be described in terms of either task or performance orientation (Pajares et al., 2000)

Affective: Affective refers to the domain of human behavior that is usually associated with feelings. Successful acquisition of a knowledge objective will bring about an associated feeling.

Evaluation : To evaluate is to make a judgement on the success and feasibility of selected items which can be of an affective, cognitive or psychomotor nature.

Expectancies : Expectancies are defined as those expectations placed on the outcome for an achievement task. These expectancies are determined by such variables as the learners' goals and self-concepts, their perceptions of parents' and teachers' expectations, their interpretations of the reasons for their performance (e.g., their attribution for past success or failure to their own ability or lack thereof), and their perception of the difficulty of the task.

Expectancies For Success: Expectancies for success are defined and measured as children's beliefs about how well they will do on an upcoming task, either in the immediate or longer term future (Eccles et al., 1983).

Expectancy Statement : An expectancy statement is a statement made regarding an individual expectancy of success following an achievement task (i.e., a science test).

Learning: The learning process has personal meaning for participants. When this process is self-regulated, the learner can acquire new insight and information that can possibly result in personal attitudinal behavior change (Zimmerman & Pons, 1988).

Metacognition : Metacognition or meta-knowing is a second-order skill which entails knowing

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about one's own knowledge or knowing.

Metamemory: Metamemory refers to knowledge about one's own memory capacities and capabilities as well as about task difficulty (Leal, 1987). The term has also been used to describe knowledge about how, when, and why one should intentionally store and retrieve information.

Performance Expectancy: Performance expectancy can be defined as an individual's perceived probability of success on a particular achievement task. This perceived probability is influenced by self-concept of ability, perception of task difficulty, perception of others' expectations, causal attributions, locus of control, sex-role identity, personal experiences, cost of success, and affective experiences.

Performance Goals: Also called "ego goals", these represent a student's concern with social comparisons, doing better than others, appearing smart, and avoiding appearing inept.

Self- Efficacy : Self-efficacy is defined as an individual's belief that he/she can influence his/her own thoughts and behavior. In research efficacy has most often been measured at the task-specific level (Pajares, 1996).

Self-Regulated Learning : Self-regulated learning is defined as learning which includes students' metacognitive strategies for planning, monitoring, and modifying their cognition (Zimmerman & Pons, 1988), as well as their management and control of effort on academic achievement tasks and the actual cognitive strategies that students use to learn, remember, and understand the material (Corno & Madinach, 1983).

Task Goals: Sometimes called "learning" or "mastery goals", these represent an individual's concern with mastering material and concepts, challenge seeking, and learning as an end

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in itself. Results have typically demonstrated that having a task goal orientation has motivational and performance benefits (Urdan, 1997).

Task Value: Task value refers to the weight or emphasis that an individual places on an achievement task (Atkinson, 1964). This task value is determined by both the characteristics of the task and by the needs, goals, and values of the individual (Parson & Gogg, 1980; Spenner & Featherman, 1978).

## Delimitations and Limitations of the Study

This study examines the effects of making explicit the performance expectancy component of teaching and learning within one classroom in one school. It cannot be utilized as an accurate indicator to foretell the effects of other explicit uses of performance expectancy in teaching and learning. Not examined are other factors which may influence the impact of teaching on learning, such as the level of teacher support and commitment.

The lack of a control group is another significant limitation within this study. It is difficult to attribute improvements or changes in behavior and learning to the explicit use of performance expectancy, when there is no control group to make comparisons with.

The study may be limited by the role of the researcher as participant, teacher and observer. The data were collected and analyzed by a researcher, who was also the teacher and was personally involved with the research and the students, and therefore some bias may have been unintentionally present. The researcher's personal belief in the efficacy of performance expectancy may have influenced the students and her interpretation of the results.

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The design of the case study was also limited to descriptive results. The data collection from tests and surveys may not have been entirely truthful or complete, and there was no formal training in performance expectancy for either the researcher, teacher, or students prior to the commencement of this study. Since this research study was isolated and involved the observation of a single grade eight class in one school, it is difficult to generalize these results to the general population.

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CHAPTER TWO

# Performance Expectancy

Performance expectancy incorporates a number of components. It includes theories of achievement motivation, which in turn includes achievement-expectancy model theory, and the elements of that theory which are "expectancies" and "task-value." All of these contribute to a theory of self-regulated learning. In this review, the interrelationship between the various elements of achievement form a model of performance expectancy as one of the functions of self-regulated learning.

The general conception of achievement motivation owes much to the seminal work of the personality theorist Henry Murray. Influenced by psychoanalytic thought, Murray conceived of personality as a series of needs, described as an "organic potentiality or readiness to respond in a certain way under given conditions' (1938, p. 60). Among these needs is the need to achieve, which Murray describes as "the desire or tendency to do things as rapidly and/or as well as possible . . . to accomplish something difficult. To master, manipulate, and organize physical, objects, human beings, or ideas . . . To overcome obstacles and attain a high standard. To excel ones' self. To rival and surpass others" (1980, p. 164). Murray postulated that these needs are largely unconscious; accordingly, he devised a projective instrument, the Thematic Apperception Test (TAT) to assess them. The TAT consists of a series of ambiguous pictures of one or more



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people about whom test respondents are asked to tell a story. The fantasy material is then coded for the presence of imagery relating to various needs.

John Atkinson and David McClelland adopted the TAT techniques to measure the need (or motive) to achieve by selecting pictures with the capacity to elicit achievement imagery. In adopting the TAT as their measure of the motive to achieve, Atkinson and McClelland accepted Murray's view that motives are acquired dispositional tendencies that are general in nature and not tightly linked to specific situations and that they tend to be stable over time. They further conceived of motives as having both activating and affective properties and directive or goal-oriented properties. As Atkinson put it when describing both motives in general and the motive to achieve in particular:

> A motive is conceived as the disposition to strive for a certain kind of satisfaction, as a capacity for satisfaction in the attainment of a certain class of incentive. The names given to motive-- such as achievement-- are really names of classes of incentives which produce essentially the same kind of experience of satisfaction [for example, in the case of achievement motive]: pride in accomplishment . . . The general aim of one class of motives, usually referred to as appetite or approach tendencies, is to maximize the satisfaction of some kind. The achievement motivation is considered a disposition to approach success. (1960, p. 13)

Like other motives, the motive to achieve remains latent until aroused by appropriate internal or environmental cues.

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## Expectancy-Value Theory

The concept of achievement motive defined as a stable personality characteristic was incorporated into a larger theory of achievement motivation proposed by Atkinson (1975). The expectancy-value theory, as it has come to be known, specifies that the strength of the achievement motive (or as it is alternately labeled, the tendency to achieve) actually aroused in any achievement-oriented situation is determined by the sum of two tendencies, the tendency to approach success and the tendency to avoid failure (Eccles et al., 1983; Wigfield, 1994, Wigfield & Eccles, 1992). The first tendency is manifested by engaging in achievement-oriented activities, and is referred to as the tendency to approach success (Elliot & Harackiewicz, 1996). On the other hand, the tendency to avoid failure, the second tendency, is manifested by not engaging in these activities (Midgely & Urdan, 1995).

The strength of these opposing tendencies is determined by three components. These components include the motive to approach success/avoid failure, the expectancy (probability) that an achievement-oriented act will result in success/failure, and the incentive value of success/failure. The latter two variables give Atkinson's theory its expectancy-value label.

The motive to approach success is an individual-difference variable and, like the motive to avoid failure (also called fear of failure), it is a stable personality characteristic that has been acquired as a result of past experiences (Marsh, 1990). The second component determining the tendency to approach success or the tendency to approach failure is expectancy which is defined as the probability that engaging in an achievement-oriented activity will result in success or in failure. In experimental situations designed to test the implications of expectancy-value theory,

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the expectancy variable has been either subjectively defined by having subjects give their estimate of the probability that they will succeed prior to undertaking the task, or it has been experimentally manipulated by such methods as supplying subjects with performance norms from which the task's level of difficulty can be inferred, or by first giving them similar tasks on which they succeed or fail (Meece, Blumenfeld, & Hoyle, 1988). The third component, incentive value of success or failure, has been described by researchers as the degree of anticipated satisfaction or pride in succeeding at a task or the degree of anticipated shame in failing (Wigfield, 1994 ). In practice, the operationalization of the incentive factor has been reduced to a property of probability of success. The higher a person's probability of success is, the lower the attractiveness or incentive value of success. This relationship between probability of success/failure and incentive value of success/failure is also closely linked to task difficulty (Marsh, 1990). A task which is perceived as difficult will have a lower probability of success, an increase in the incentive value of success (pride in succeeding), and a decrease in the incentive value of failure or shame in failing (Zimmerman, Bandura, & Martinez-Pons, 1992).

Many of the tests of the implications of the theory have been experimental studies that were conducted in the laboratory and that involved the manipulation of such variables as task success and failure (Atkinson & Rayney, 1974). Relatively few attempts have been made to explore the implications of the theory to task performance per se (e.g., number of tasks mastered, speed of mastery, quality of performance). More thoroughly investigated have been the predictions of the theory for such measures as level of aspirations, task persistence, and risk taking in choice of task difficulty (Meece, Blumenfeld, & Hoyle, 1988; Skaalvik, 1997).

Perhaps the most intriguing aspect of the expectancy-value theory involves the

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predictions about an individual's preferred level of task difficulty. The theory suggests that, for individuals in whom the motive to approach success is stronger than the motive to avoid failure, the tendency to achieve is strongest in situations in which the probability of success is greater than one-half (Deci & Ryan, 1985). These success-oriented individuals are therefore more likely to choose tasks of intermediate difficulty and to persist at their attempt to complete them longer than at tasks that are either higher or lower in difficulty. The mathematics of the theory also implies that those individuals in whom the dominant motive is to avoid failure are those least likely to choose or to persist at tasks of intermediate difficulty (Ryan 1995). For these failure-avoidant individuals, the tendency to achieve is predicted to be highest when task difficulty is either high or low. The bulk of the evidence suggests, however, that individuals tend to prefer tasks of intermediate difficulty, whatever the strength of their motive to achieve (Weiner, 1972).

Following the initial formulation of expectancy-value theory, Atkinson and others working within this framework have proposed a number of revisions, qualifications, and additions in order to improve and extend the theory's predictive utility. The first construct to be added to the theory was the tendency to seek extrinsic rewards (Atkinson, 1974). These extrinsic motives may buoy up achievement-oriented efforts in those whose intrinsic achievement motivation (or the tendency to approach success) is weak and/or in those in whom fear failure is strong (Eccles et al., 1998). This expectancy explains, in part, why many individuals who are failure-avoidant (as defined by the theory) obviously engage in achievement-oriented behaviors in school, on the job, and even in the laboratory. The second addition to expectancy-value theory is the concept of future orientation, proposed by Raynor (1970). Success on a task is often instrumental in allowing the individual to proceed to the next in a sequence of tasks that

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ultimately lead to a future goal. Raynor assumed that the component tendencies for all steps in the path to the future goal gather together to determine the strengths of the tendency to achieve that is operative in a given task in the sequence. The tendency to achieve is thus a result of both immediate and more distant expectancies and their associated incentive values (Zimmerman, Bandura, & Martinez-Pons, 1992).

**Expectancies**

There is ample evidence that on individual's expectations for success at tasks affect his/her behavior in task situations, (Battle, 1965; Crandall, Katkowsky, & Preston, 1962; Wigfield & Eccles, 2000). Numerous studies have demonstrated the importance of these expectancies for a variety of achievement behaviors including academic performance, task persistence and task choice (Covington & Omelich, 1979; Marsh, 1989; Wigfield et al., 1991). Developmental studies indicate that the influence of the expectancy performance increases with age and may emerge earlier and more strongly in males than females (Parsons & Ruble, 1977). By adolescence, however, expectancies are clearly related to achievement performance. Expectancies are influenced most directly by self-concept of ability and by the student's estimate of task difficulty. Historical events, past experiences of success and failure, and cultural factors have been proposed to also have indirect effects that are mediated through an individual's interpretations of these past events, perceptions of the expectancies of others, and identification with the goals and values of existing cultural role structures (Kurtz-Costes & Scheinder, 1994). Each of these influences is briefly described below:

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*1. Self-Concept of Ability*

The importance of the students' concepts of their abilities for their achievement behaviors has been discussed by several researchers (Nicholas, 1978; Skinner, Welborn & Connell, 1990). Formed through a process of observing and interpreting one's own behavior, self-concept of ability is defined as the assessment of one's competency to perform specific tasks or to carry out role-appropriate behaviors. In the view of most authors, self-concepts of ability are key causal determinants of a variety of achievement behaviors.

*2. Perceptions of Task Difficulty*

Intuitively, it seems that expectancies for success should be inversely related to perceived task difficulty (Raynor, 1970). While little research has addressed this prediction directly, there is ample evidence that task choice in experimental settings is related to perceived task difficulty. However, the relation between these two variables is not straightforward.

The evidence reviewed is not especially encouraging for investigators hoping to predict achievement expectancies, plans, or other achievement behaviors exclusively from students perceptions of the difficulty of the task. Findings from the few existing studies suggest that the effects of this variable are consistent but small. Of the two major mediators of expectancies discussed thus far, self-concept of ability appears to be the more critical construct. Perceptions of task difficulty, however, may influence self-concept of ability such that, over time, students who

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see a subject or task as more difficult develop lower estimates of their abilities for that subject or task (Kurtz-Costes & Schneider, 1994). For this reason, perceived task difficulty is included in the model of achievement behaviors as an important mediator of achievement expectancies and expectancies for success.

*3. Perceptions of Others' Expectations*

The literature on achievement has documented the importance of parents' and teachers' expectations and attitudes in shaping students' self-concepts and general expectancies of success (Brookover & Erikson, 1975). Research in this area has yielded consistent results. Students for whom parents and teachers have high expectations also have high expectations for themselves and, in fact, do better in the classroom. It seems reasonable that this effect is mediated, in part, by students' perceptions of their parents' and teachers' expectations. In support of this suggestion, Stipek (1981) has found a significant positive relationship between students' self-concepts and perceptions of task ease, and perceived parental evaluations. As yet, however, the causal direction of this relation is unclear.

*4. Causal Attributions*

It has been rather definitively documented that causal attributions influence expectancy of success. This is a necessary linkage for the development of an attributional theory of motivation, inasmuch as goal anticipation certainly affects other thoughts and actions (Weiner, 1985). Future

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expectancies are influenced not by the success or failure per se, but by the causal attributions. For example, if people attribute success to a stable factor such as ability, then they should expect continued success. If, on the other hand, they attribute success to an unstable factor such as effort or good luck, they should be uncertain about future outcomes. Similarly, attributing failure to stable factors should produce expectations of continued failure, while attributing failure to unstable factors should not. Therefore, individuals who attribute their success to an unstable factors, such as task and ease, and their failure to a stable factor such as lack of ability should have lower expectancies than do individuals exhibiting the reverse attributions pattern, even if their performance histories have been identical. Several studies have provided indirect support for these general hypotheses (Dweck, 1975; Corno & Mandinach, 1985).

*5. Locus of Control*

Locus of control is closely related to the attribution theory. Based on the work of Rotter (1954), Virginia and Vaughn Crandall (1969) developed the construct of intellectual-achievement responsibility, arguing that the belief that one is responsible for, or in control of, achievement outcomes is important and beneficial. Taking this construct one step further, the concept of learned helplessness has been introduced to describe students who assume they cannot control their failures (Dwek, 1975 ). These influences are all part of the expectancy-value theory, but none of these has actually proven to be an adequate predictor of choices of tasks, success, or failure.

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**Task Value**

In Atkinson's larger theory of achievement motivation (1964), the value that an individual attaches to success or failure on a task is assumed to be a critical determinant of achievement motivation. Atkinson's narrow definition of the concept was based on objective task characteristics. Other theorists have used a broader, more individualistic concept of "task value" (Parsons & Goff, 1980; Spenner & Featherman, 1978; Eccles et al., 1983) in which the value of a task is determined both by the characteristics of the task and by the needs, goals, and values of the person. The degree to which the task is able to fulfill needs, facilitate reaching goals, or affirm personal values determines the value a person attaches to engaging in that task. In the task value theory, the overall specific task is seen as a function of three components. One of these components, referred to as intrinsic or interest value, is the inherent, immediate enjoyment one gets from engaging in an activity and requires no further explanation. The remaining two components are (1) the attainment value of the task and, (2) the utility value of the task for future goals.

*1. Attainment Value*

Attainment value is the importance of doing well on the task. In its broader form, it incorporates a variety of dimensions, including perceptions of the task's ability to confirm salient and valued characteristics of the self (e.g., masculinity, femininity, competence), to provide a

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challenge, and to offer a forum for fulfilling achievement, power, and social needs (Pintrich & De Groot, 1990). The perceived qualities of the task determine its attainment value through the interaction with an individual's needs and self-perceptions. Consider for example, a student who thinks of herself as "smart" and defines a certain course (e.g., chemistry) as both intellectually and "the" course for "smart" students to take. The attainment value of such a course for this particular student would be high, precisely because doing well in it would affirm a critical component of her self-concept.

*2. Utility Value*

Utility value is determined by the importance of the task for some future goal that might itself be somewhat unrelated to the process nature of the task at hand (Deci & Ryan, 1985). For example, a high school student who wants to be a veterinarian may need to take a particular course (e.g., Chemistry) in order to gain entry into the appropriate training program. Consequently, she may take advanced science classes, even though she has little or no interest in chemistry itself. In this case, the desirability of her career goal and the instrumentality of chemistry in helping her to achieve the goal would outweigh the her neutral or even negative attitude toward the subject matter. In this instance, the value of the chemistry course is high precisely because of its long range utility.

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**Integrating Expectancies and Task Values**

Therefore, the value of a particular task to a particular person is a function of both the perceived qualities of the task, including attainment, intrinsic, and utility value; in terms of task, the individual's expectancies as related to (1) self-concept of ability, (2) perceptions of task difficulty, (3) perceptions of others' expectations, (4) causal attributions, and (5) locus of control. Individual differences on these variables are created by differential past experiences with that task or with similar tasks, by social stereotypes (e.g., the perception of science as a male domain), and by differential information from parents, teachers, or peers about the importance of, or difficulty, involved in doing well. A sizable portion of both the empirical and theoretical literature related to the processes of socialization has suggested that various needs and values influence the form of an individual's achievement behavior (Hoffman, 1972; Parsons & Goff, 1980; Spenner & Featherman, 1978; Kurtz-Costes & Schneider, 1994). The importance of the centrality of values and needs to one's self-definition has been a recurring theme. There are three variables which seem to be particularly important mediators: (1) sex role identity and personal experiences, (2) perceptions of the cost of success or failure, and (3) previous affective experiences with similar tasks.

*1. Sex-Role Identity and Personal Values*

The need to behave according to a set of social prescriptions for sex-appropriate conduct, or sex-role identity is an important component of achievement behaviour. Proponents of the

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cognitive developmental model of sex-role acquisition -e.g., Kohlberg, 1969; Parsons, Frieze, and Ruble (1976) have suggested that sex roles influence achievement behaviour through their impact on perceived task value. Specific tasks are identified as either consistent or inconsistent with one's sex-role identity. The extent to which a task is consistent with one's sex-role identity influences the value of that task. In partial support of this view, several studies have documented the influences of sex labeling of tasks on students performance and choice (e.g., Sherman, 1979).

Studies of adolescent values have suggested that males become more oriented toward achievement in school with age, while females become more concerned with the potential conflict between their academic goals and their social goals (Marsh, 1989) . Central to this line of argument is the assumption that sex-role identity and the sex stereotyping of particular achievement activities interact in influencing task value. That is, sex typing of the task will affect its perceived value only to the extent that one's sex-role identity is a critical and salient component of one's self-concept. Conversely, sex-role identity should influence task value only to the extent that the task is sex-typed by the individual. For example, the value of science should be low for a female who sees science as a masculine activity and avoids masculine activities as one way to affirm her "femininity." Among those females who do not see scientific competence as a masculine characteristic, sex-role identity should not be related to the perceived task-value.

*2. Cost of Success or Failure*

The cost of success or failure is another factor which can affect the value of a task to an individual. Variables influencing the cost of the activity include (1) the amount of effort needed

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to succeed, (2) the amount of time taken from other valued activities, and (3) the individual's psychological interpretation of failure. Kukla (1972) has suggested that perceived effort needed for success may be a key determinant of achievement behaviour.

Kukla has argued that a person calculates the minimal amount of effort needed to succeed on a task (i.e., to do as well as one considers essential), given that person's estimate of her or his ability and the difficulty of the task. The individual then exerts that minimal effort. If we assume that individuals have a sense of how much effort they think is worthwhile for various activities, then we could extend Kukla's argument to the following prediction: as the anticipated amount of effort increases in relation to the amount of effort considered worthwhile, then the value of the task to the individual should decrease. That is, as the cost/benefit ratio in terms of amount of effort needed to do well increases, the value of the task to the individual should decrease.

Closely related to the cost of effort involved is the cost of a task in terms of the time lost for other valued activities (Pintrach & DeGroot, 1990). Students have limited time and energy. If they spend an hour on one task, then they will have one less hour available for another task. Thus, they must make choices among various activities. Often other activities which are more social in nature will be seen as more important and have a much higher incentive goal than academic activities such as studying. This analysis highlights the necessity of thinking about various achievement-related behaviours within the broad social array of behavioural options available to people.

Both the cost of success and the loss of valued alternatives are based on the assumption of anticipated success. Yet the perceived value of the task will certainly be affected if the student is unsure of success or certain of failure. Consider those students who view themselves as

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competent, have strong achievement needs, yet are unsure of their scientific ability and feel that they will have to try exceptionally hard to do well in their next science course. For these students, the cost of failure is high because failing to do well has important implications for their self-concept. In addition, these students would also be unsure of success and would believe that the amount of effort needed to do well would be high.

*3. Previous Affective Experiences*

A wide range of emotional responses is often elicited by achievement activities. Past affect-laden experiences can influence one's responses to similar tasks in the present or future. For example, if one has had bad experiences with a science teacher in the past, one may be less positive in general toward current science courses and science teachers. To understand the value of various achievement activities, then, it is important to consider variations in the affective experiences students have had with different achievement activities. Variations in these experiences can take two quite different forms: (1) variations caused by overt, objective events such as success, failure, and the responses or behaviours of major socializers such as parents and teachers; and (2) variations created by psychological factors such as causal attributions and individual differences in confidence or anxiety (Wigfield, 1994).

Past successes and failures themselves have been shown to elicit characteristic affective responses (e.g., Weiner, Russell, and Lerman, 1978). Success, especially on challenging tasks, leads to positive feelings; failure, especially on easy tasks, leads to negative feelings. Other things being equal, these affective responses would influence the enjoyment or intrinsic value of

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subsequent related activities. One would like activities that have been associated with positive feelings in the past more than activities that have been associated with negative feelings. Both affect-laden behaviours of teachers and parents (e.g., praise, criticism, public ostracism, and rejection) and more general experiences in school (e.g., test-taking procedures and curriculum variations) could have similar affects.

Another aspect of the affective experience is the locus of the attribution of the reason for success. Weiner (1972) has proposed that attributions of success and failure influence one's affective response to achievement tasks, such that attributing success and failure internally magnifies the associated results. Thus, individuals would feel best about success attributed to abilities and efforts, and feel worst about failures attributed to a lack of effort and/or ability. Evidence has supported this prediction. Researchers such as Weiner (1985) have also found that attributing one's success internally leads to feelings of pride, satisfaction, and competence, while attributing success externally leads to feelings of gratitude and surprise. Thus, it appears that attributions influence, in part, the affective responses one experiences in achievement setting. Individual differences in attributional patterns, consequently, would produce individual differences in the affect associated with similar tasks, which, in turn, would influence the value of these tasks.

**Summary of Expectancy-Value Theory**

The expectancy-value theory has been related to several expectancies including the following: self-concept of ability; perceptions of task difficulty; perceptions of others'

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expectations; causal attributions; and locus of control. The interrelationship between these expectancies and the task value as a function of attainment value, intrinsic value, and utility value is clear. The three variables which are particularly important mediators of this interrelationship are sex-role stereotyping and personal values, cost of success or failure, and previous affective experiences.

## Self-Regulated Learning

There are a variety of definitions of self-regulated learning, but three components seem especially important for classroom performance: students' metacognitive strategies for planning, monitoring, and modifying cognition (Zimmerman & Pons, 1988); students' management and control of their effort on classroom academic tasks; and the actual cognitive strategies that students use to learn, remember, and understand the material (Corno & Mandinach, 1983). Different cognitive strategies such as rehearsal, elaboration, and organizational strategies have been found to foster active cognitive engagement in learning and result in higher levels of achievement. These three components combine to constitute a working definition of self-regulated learning. Thus, self-regulated learning in its simplest form is the assessment of one's self-knowledge level and then the application of appropriate strategies to improve performance.

Research has established a relationship between self-regulated learning and the general expectancy-value model of motivation (Pintrach & DeGroot, 1990). The two main motivational components identified earlier -- that is, (a) an expectancy component, which includes students' beliefs about their ability to perform a task, and (b) a value component, which includes students'

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goals, beliefs about the importance and interests of the task, and students' emotional reactions to the task -- are intrinsically linked to the three different components of self-regulated learning.

The expectancy component involves students' answers to the question, "Can I do this task?" Different aspects of the expectancy component have been linked to students' metacognition, their use of cognitive strategies, and their effort management. In general, the research suggests that students who believe they are capable engage in more metacognition, use more cognitive strategies, and are more likely to persist at a task than students who do not believe they can perform the task (Corno & Mandinach, 1983).

The value component of student motivation involves students' goals for the task and their beliefs about the importance and interest of the task. Although this component has been conceptualized in a variety of ways (e.g., learning vs. performance goals, intrinsic vs. extrinsic orientation, task value, and intrinsic interest), it essentially concerns students' reasons for undertaking a task. In other words, what are students' individual answers to the question, "Why am I doing this task?" The research suggests that students with a motivational orientation involving goal mastery, learning, and challenge, as well as beliefs that the task is interesting and important, will engage in more metacogntive activity, more cognitive strategy use, and more effective effort management (Ames & Archer, 1988).

The expectancy and value components have been positively related to the three self-regulated learning components in research by Pintrach and DeGroot (1990). Self-efficacy was positively related to student cognitive engagement and performance. Students who believed they were capable were more likely to be more self-regulating in terms of reporting more use of metacogntive strategies, and to persist more often at a difficult uninteresting academic task. This

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finding implies that teaching students about different cognitive and self-regulatory strategies is important for improving actual performance on classroom academic tasks, and conversely students' self-efficacy beliefs may lead to more use of these cognitive strategies (Parsons & Geoff, 1980).

## Summary

The literature relates several concepts of the predictive process to the background of self-regulated learning. The following model, schematically presented in Figure 1, identifies those concepts and shows their relationship.

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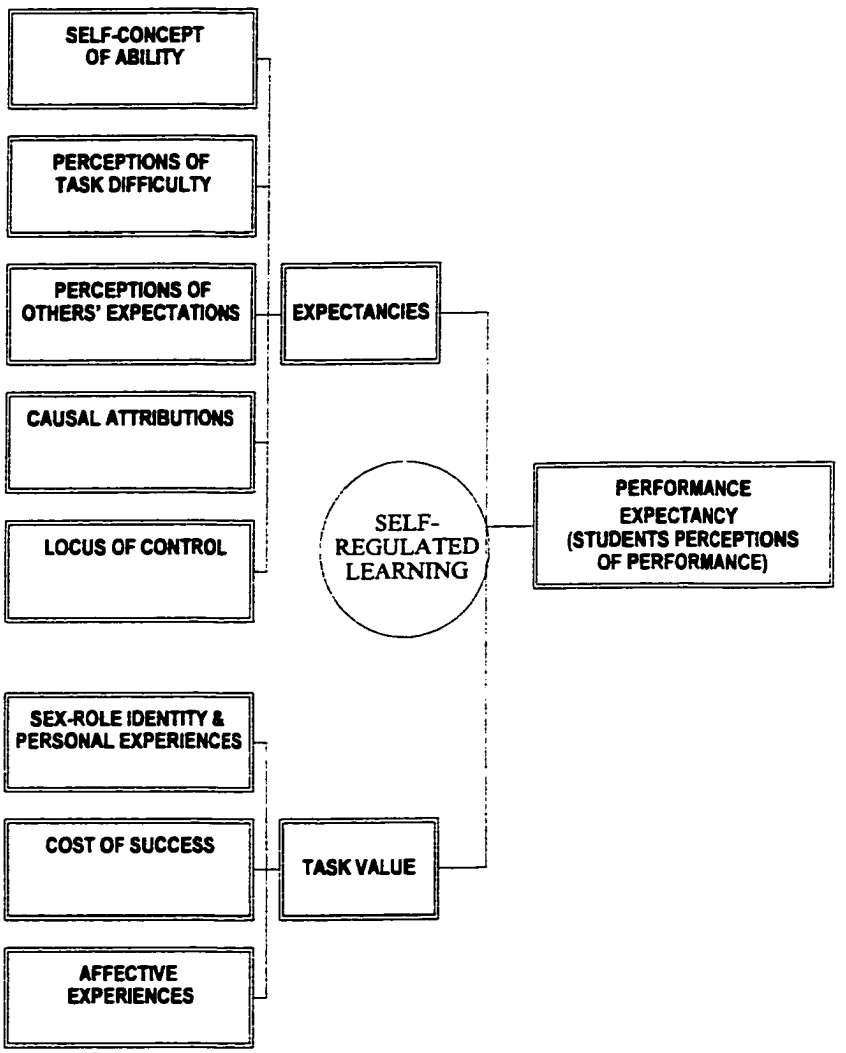


Figure 1

**Model of Performance Expectancy As a Function of Self-Regulated Learning**

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The model itself is built on the concepts of students' task specific self-concept and students' perceptions of task value, which are an important aspect of self-regulated learning. As student's task specific self-concept is mediated by self-concept, perception of task difficulty, causal attributions, and locus of control. In a parallel position are the factors which determine a student's perception of task value, factors which include sex-role identity and personal experiences, cost of success or failure, and affective experiences. These eight components (self-concept, perception of task difficulty, perception's of others expectations, causal attributions, locus of control, sex-role identity and personal experiences, cost of success or failure, and affective experiences) are interrelated in that each factor has the potential to influence the others. For example, a student's affective experience such as failing a particularly easy test will certainly influence a student's self-concept and his/her perception of task difficulty for future tests. Thus, a student's task specific self-concept and a student's perception of task value will both affect performance expectancy. The performance expectancy, then, is the student's perception of performance, which interacts with and influences those seven components discussed earlier. The cyclical and interdependent principle of performance expectancy is demonstrated in the model in Figure 1.0.

In this study, an attempt has been made to examine the performance expectancy aspect of teaching and learning. In this instance, performance expectancy has not been taken for granted, but rather has been made an explicit part of each student's self-regulated learning experience. The affects of making this performance expectancy an explicit component of teaching and learning is examined.

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CHAPTER THREE

# Methodology

From a review of literature it becomes clear that the formation of performance expectancies as a function of self-regulated learning is influenced by expectancies and task value. If the components of task value are combined with expectancies, these become integral parts of self-regulated learning. As demonstrated in Figure 1.0, self-regulated learning is affected by self-concept of ability; perception of task difficult; perceptions of others expectations; causal attributions; locus of control; sex-role identity; cost of success; and affective experiences. All of these elements are interrelated in that they all affect a student's performance on tests. This is a study of students' performance expectancy when it used as an explicit and integral part of the teaching and learning process. The methodology for this study evolved from personal experiences in the classroom. It is a type of action research which also evolved from personal interest in performance expectancy and student success.

## The Situation

During the 1999-2000 academic year, participants were issued a number of unit tests for each of the five science strands from the Ontario Curriculum. Topics included in each strand are as follows: "Life Systems"-Cells, Tissues, Organs, and Systems; "Matter & Materials"-Fluids;



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"Energy and Control"-Optics; "Structures and Mechanisms"-Mechanical Efficiency; and "Earth and Space Systems"-Water Systems. These unit tests were administered by the classroom teacher for assessment/evaluation purposes. Upon completion of each test, participants were asked to state the following: (1) the number of minutes they studied for the test, (2) the difficulty or ease of the test, and (3) their predicted score. These three components are interrelated aspects of performance expectancy.

In stating the number of minutes they studied, participants were simply asked to record approximately the total number of minutes they had spent preparing for the test. The difficulty or ease of the test was stated by using a Likert type scale of 1-3-5, a "1" indicating an easy test, a "3" indicating a test of medium difficulty, and a "5" indicating a difficult test. Participants also recorded their predicted score, that is the score they believed/predicted that they would receive.

## The Study

The 21 participants in this research were enrolled in grade eight at a rural, open-concept elementary school in North Western Ontario, with a population of almost three hundred. The selected grade eight class consisted of 21 typical students, among whom two were identified with special needs. There were 9 (43%) females and 12 (57%) males.

In early June, 2000, all participants in the selected grade eight class were informed about the purpose, the design, and the proposed implication of the study. Their participation, which included allowing their selected data to be used and completing a short survey, was completely voluntary and had no bearing on their final evaluation in science. The participants and their

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parents received a letter (Appendix A) and consent form (Appendix B), and were asked to sign if they understood the purpose of the study and were willing to participate in it. Returned consent forms included pseudonyms which guaranteed their anonymity.

**Data Collection**

Data were obtained from two sources:

1) *A classroom data file* : A file was collected by the classroom teacher for evaluative purposes. All tests and some selected assignments for the entire year were placed in these files as an ongoing record of each student's progress throughout the year. Within this file, each student had all of her/his science tests for the year, complete with minutes studied, test rating, and predicted score. Table 1 outlines the dates of the science tests:

Table 1

Dates of Science Tests

| Test | Date |
|---|---|
| Test 1 | October 14, 1999 |
| Test 2 | November 24, 1999 |
| Test 3 | December 21, 1999 |
| Test 4 | February 6, 2000 |
| Test 5 | March 30, 2000 |
| Test 6 | May 4, 2000 |

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2) *A student survey* : In a student survey (Appendix C) administered to students in mid-June, 2000, three questions were asked concerning students' perceptions of performance expectancy. These questions were as follows: (1) Do you think that your scores have improved as a result of making score predictions throughout the year? Explain. (2) Has the accuracy of your predictions improved throughout the year? Explain. (3) Have your study habits changed in any way as a result of making score predictions throughout the year? Explain. (Appendix C).

**Data Analysis**

Of the five research questions which guided the research, the first two were related to quantitative data collected from the classroom files.

1. Which variables (predicted score, study time, test rating) best predict student scores?

2. Does the accuracy (the closeness of the student's predicted score to his/her actual score) of student's expectancy statements change with practice?

The remaining three were related to the qualitative data collected from the students' surveys.

3. Do students think the use of expectancy statements is helpful in improving their scores?

4. Do students think that the expectancy statements become more accurate with practice?

5. Do students think that their study habits change through the use of expectancy

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statements?

**Quantitative Data Analysis**

Descriptive statistics were calculated for each variable (test score, predicted score, absolute difference between test score and predicted score, study, and test rating) and reported as means ($\bar{x}$) and $\pm$ standard deviations (S.D.).

The data was analyzed using the Statistical Package of Social Sciences (SPSS) Version 10.0. Alpha was established *a priori* at $p < .05$ for all comparisons.

The quantitative data analysis were organized in terms of the following two research questions:

1) *Which variables (predicted score, study time, test rating) best predict student scores?* A stepwise multiple-regression analysis was used to determine the factors (predicted score, minutes studies, test rating) which best predicted test score.

2) *Does the accuracy of students' expectancy statements change with practice?* The closer the student's predicted score to his/her actual score, then the more accurate was that student's expectancy statement. An analysis of variance (ANOVA) was used to compare means between tests using absolute differences between the predicted and actual score as the dependent variable.

**Qualitative Data Analysis**

Qualitative data analysis involves working with data, and organizing the information into

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"manageable units . . . searching for patterns, discovering what is important and what is to be learned" (Bogden & Biklen, 1992 p.153). Data were organized and analyzed according to the following three research questions:

3) *Do students think the use of expectancy statements as helpful in improving their scores?* Data from Question 1 of the survey were analyzed to answer this question. Differences between male and female responses were also examined.

4) *Do students think that the expectancy statements become more accurate with practice?* Data from question 2 of the survey were analyzed to answer this question. Differences between male and female responses were also examined.

*5) Do students think that their study habits change through the use of expectancy statements?* Data from question 3 of the survey were analyzed to answer this question. Differences between male and female responses were also examined.

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CHAPTER FOUR

# FINDINGS AND INTERPRETATIONS

## Introduction

The purpose of this study was to investigate the effects of making explicit the performance expectancy component of teaching and learning for Grade 8 science students.

The findings are reported according to the five research questions, which were organized quantitatively and qualitatively, as well as according to themes and understanding.

### Quantitative Results

Table 4.1 shows the descriptive statistics for test score, predicted score, absolute difference between test score and predicted score, study time, and test rating.

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Table 2

Descriptive Statistics, $\bar{x}$ (S.D.)

| | N | Test Score | Predicted Score | Absolute Difference Between Test Score & Predicted Score | Study Time | Test Rating |
|---|---|---|---|---|---|---|
| Test 1 | 19 | 72.7 (16.5) | 78.4 (11.7) | 12.7 (11.0) | 32.7 (30.9) | 2.8 (1.0) |
| Test 2 | 19 | 69.6 (15.6) | 76.8 (15.4) | 9.7 (12.7) | 36.0 (36.0) | 3.3 (0.7) |
| Test 3 | 21 | 61.4 (15.6) | 71.9 (12.0) | 14.6 (15.1) | 46.8 (51.9) | 3.7 (1.0) |
| Test 4 | 20 | 68.3 (24.2) | 77.3 (15.8) | 12.3 (13.8) | 54.7 (69.5) | 3.2 (1.1) |
| Test 5 | 21 | 78.9 (14.6) | 74.9 (20.2) | 8.7 (16.7) | 131.2 (109.6) | 3.4 (1.4) |
| Test 6 | 21 | 78.9 (11.5) | 73.0 (17.6) | 10.9 (12.4) | 55.1 (43.9) | 3.2 ( 1.3) |

**1) Which variables (predicted score, study time, test rating) best predict student scores?**

A stepwise multiple-regression analysis was conducted to determine the factors (predicted score, minutes studies, test rating) which best predicted test score. Only the predicted test score was entered into the multiple-regression model and was significant $F(1, 117) = 25.67$, $p < .05$, in predicting actual test scores, accounting for only 18% of the variance ( $r = .18$).

**2) Does the accuracy (the closeness of the student's predicted score to his/her actual score) of a student's expectancy statements change with practice?**

An analysis of variance (ANOVA) of the absolute differences between predicted and actual test scores did not reveal a significant difference between tests: $F(5, 114) = 0.494$, $p > .05$.

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It is important to note that there is large variability associated with each test as denoted by the large standard deviation, which ultimately contributed to the non-significant results.

**Qualitative Results**

**3) Do students think the use of expectancy statements as helpful in improving their scores?**

Through the student survey it was determined that only 38% or 8 of the 21 students believed that making explicit the performance expectancy component of teaching and learning improved their academic performance by raising their scores. The following table (Table 2.2) summarizes student responses to Question 1 from the Student Survey (Appendix C ).

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Table 3

Summary of Student Responses for Survey Question 1

| Do you think that your scores have improved as a result of making score predictions? | | | |
|---|---|---|---|
| ***Yes*** | | **No** | |
| *Male* | *Female* | *Male* | *Female* |
| Simon | Janice | Norm | Cindy |
| Peter | Anne | Mike | Clara |
| Frank | Gwen | Jeff | Marcia |
| Patrick | Karen | Andrew | Diana |
| | | Chris | Lisa |
| | | Scott | |
| | | Joel | |
| | | Arnold | |

When asked to explain why making score predictions had improved their academic performance, several students explained that the act of making score predictions inspired them to raise their achievement level by putting forth a greater effort to succeed. Gwen explained that making score predictions made her want to beat her prediction and in so doing improved her score. "Score predictions makes me study more and try harder" was Patrick's response. Some students spoke about the importance of making reasonable score predictions. "When you predict your score and make the prediction reasonable, you aim higher and try harder on the test to meet

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and exceed your predicted score" (Simon). Other students even identified a relationship between confidence level and score prediction. Janice stated that "as a result of score predictions she had more confidence in herself."

Other participants felt that the act of making score predictions was simply another activity that they were required to complete, but that it did not improve their scores in any way. "I do not think that making score predictions throughout the year has improved my scores. The amount of time that I studied is what improved my score," commented Lisa. Another student (Cindy) stated "No, I don't think that my scores have improved because of the score predictions, because that is just something that we do on the test to see if we did all right, and I really don't even notice that it is there. It is just something you do; it doesn't help you." Finally, Clara declared, "I think that my scores have pretty much stayed the same as a result of making score predictions throughout the year because it's really just another thing that I have to fill out. I just guess on the predictions by looking at the questions that I have done and putting my own score in the spaces to determine what I got on each question. Then I add the scores up."

Several students also identified several factors that had influenced their score predictions. For example, as Marcia explained, "I didn't think predicting my score was that important because I thought it was only to help you (the teacher) to see how good we were getting, so I always wrote down a low number so I would get better than it on the test's real score." Jeff added, "I don't really think my scores have improved as a result of making score predictions throughout the year because, when I put down a predicted score, I always put really low so that I won't get under my predicted score."

It was interesting to note that of those students who stated that score predictions had no

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effect on their academic performance several identified other positive side-effects to making score predictions. For example, Joel stated, "I don't think making score predictions helps me get better scores, but it does help me find mistakes that I made on my tests because when I'm making predictions I tally up all the answers I think I'll get right and then sometimes I find mistakes and it does help." Mike explained that he didn't actually really notice a difference in his scores. "I think this because in answering a predicted score you really don't think too much of it at the time, but it does really boost your confidence about answering the test questions." Once again, students seem to identify confidence as an area that is positively affected by making explicit the use of the performance expectancy component." Finally some students commented on the connection between study habits and score prediction. Although "a simple prediction really wouldn't improve my score, it might make me study more for the test so my prediction would be better" (Diana). Overall, most of the students, 62 %, or 13 of 21, did not believe that making explicit the performance expectancy component of teaching and learning improved their scores; however, several other improvements were identified including increased confidence and improved study habits.

When gender comparisons were made, it was observed that 33 % of the male participants and 44 % of the female participants perceived that their scores had improved as a result of making score predictions. On the other hand, 67 % of the males and 56 % of the females did not believe that their scores had improved as a result of making score predictions. The gender differences here seem to be minor.

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**4) Do students think that the expectancy statements become more accurate with practice?**

Through the student survey, it was determined that only 57% or 12 of the 21 students believed that the accuracy of their score predictions improved throughout the year . The following table summarizes the responses to Question 2 from the Student Survey (Appendix C).

Table 4

Summary of Student Responses for Survey Question 2

| Has the accuracy of your predictions improved throughout the year? | | | |
|---|---|---|---|
| ***Yes*** | | No | |
| *Male* | *Female* | *Male* | *Female* |
| Simon | Clara | Norm | Janice |
| Mike | Lisa | Jeff | Ann |
| Peter | Gwen | Andrew | Cindy |
| Chris | Karen | Frank | Marcia |
| Patrick | | | Diana |
| Scott | | | |
| Joel | | | |
| Arnold | | | |

When students were asked to explain why the accuracy of their score predictions had improved throughout the year, their responses fell into two categories. The first category was related to strategy improvements, that is, strategies that they had used to help them find their

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predicted scores. For example, Lisa stated that the accuracy of her predictions had improved throughout the year because she had become more successful at determining the number of questions she answered correctly. "When I'm filling out the test, I add up all the questions that I think I got wrong, then subtract that from the total questions, and get my predicted score." Like Lisa, Mike used the "degree of confidence he had in answering each question to help him get a rough idea of his predicted score." On the other hand, Simon's beliefs for his improvements in score predictions were not so much based on confidence as a "greater awareness of his capabilities." Peter explained that his "score predictions had been getting closer each test that he took, since [he] now [had] a better idea of how to predict [his] score"; as a result, " it was getting easier [for him] to make score predictions." One student, Joel, made a clear connection between his earlier less effective strategies and those which he employed later on: "At the beginning of the year, I would put a number just lower than what the test was out of, but now I tally up the questions that I did and put that score as my prediction."

The second category that student responses fell into was less explicit. Gwen explained that, after studying hard and trying her best on each test, she "got a feel" for her predicted score. Arnold's response like Gwen's was that "after predicting for a while you can almost know what you will get on a test." Both students failed to identify where this sense of "knowing" came from and what factors influenced it.

Among those students who stated that the accuracy of their score predictions didn't improve, several admitted to intentionally underestimating their predicted score. As Andrew stated, "I purposefully guessed lower, because if I guessed 100 % I'd get too confident and then get a lower score, and feel bad." Marcia, like Andrew, also recorded a lower predicted score,

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even though she thought she might get higher, "at the end I would bump it [my predicted score] down so that my real score would always be better."

In summary, a significant percentage (57%) of the students believed that the accuracy of their score predictions improved throughout the year. Students' responses gave the researcher some insight into the various strategies that students used to find their score predictions, as well as various factors which influenced their score predictions.

Gender comparisons for this survey question revealed that more males ( 67 %) than females ( 44 %) perceived the accuracy of their score predictions improving throughout the year. Only 33 % of the male students felt that the accuracy of their score predictions was not improving, whereas over half (56 %) of the female students had similar perceptions.

**5) Do students think that their study habits change through the use of expectancy statements?**

Through the student survey it was determined that only 38% or 8 of the 21 students believed that their study habits changed through the use of expectancy statements. The following table summarizes the responses to Question 3 from the Student Survey (Appendix C ).

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Table 5

Summary of Student Responses for Survey Question 3

| Have your study habits changed in anyway as a result of making score predictions throughout this year ? | | | |
|---|---|---|---|
| ***Yes*** | | No | |
| *Male* | *Female* | *Male* | *Female* |
| Simon | Anne | Mike | Janice |
| Norm | Clara | Jeff | Cindy |
| Frank | Gwen | Peter | Marcia |
| Patrick | Karen | Andrew | Diana |
| | | Chris | Lisa |
| | | Scott | |
| | | Joel | |
| | | Arnold | |

The participants identified a number of factors which influenced their study habits specifically related to the desire to "do better" and raise their actual scores. As Norm explained, "I study to get a better score." Of those students who stated that their study habits had changed, several also explained that this change was motivated by another desire, that is, to make more accurate predictions. Frank explained that his study habits had changed because he studied more in an attempt to be better prepared to make accurate score predictions. Karen, on the other hand, identified a cause-and-effect relationship between her study habits and predicted scores: "My study habits have changed because, if I get a lower score on the test, and it's lower than my

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prediction, then I'll study harder next time." Once again, the relationship between score prediction and confidence level was brought forward as Simon explained that his confidence level had been increased as a result of studying more and making a more accurate prediction.

Several students acknowledged that their study habits did improve, yet they emphasized that this change was not due to score predictions: "My study habits have changed because I want a good score not because I want a good prediction," explained Marcia. Joel also failed to identify a relationship between score prediction and study habits: "My study habits have not changed as result of making predictions. When I'm studying I'm not thinking about score predictions." Cindy added that, since she didn't think score predictions really mattered, her studying was also unaffected by them.

In conclusion, only 38% of the students believed that their study habits changed through the use of expectancy statements. Of those students, several identified a relationship between score prediction and motivation as well as confidence.

Gender differences regarding male and female response were small. Of the male students, 33 % perceived that their study habits had improved as a result of making score predictions, while 67 % felt otherwise. Results were similar with the female students, of whom only 44 % perceived a change in study habits, and 56 % perceived no change.

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CHAPTER FIVE

# DISCUSSION AND CONCLUSIONS

The discussion of the five major research questions will be presented in the first section. This discussion will be followed by some recommendations and suggestions for further study.

## Discussion

Through the analysis it was rather clear that a student's predicted score was the only factor which was significant in predicting actual test scores. Yet the small amount of variance within the test scores which was actually accounted for by students' predicted scores was only 18%, indicating that 82% of the variance in students' test scores was associated with other factors.

This finding should not lead to the conclusion that the relationship between performance expectancy and student success is consistently weak. The strength of the relationship between self-assessment/performance expectancy and achievement depends on many factors, including subject areas (Kozulin & Presseisen, 1995). In fact, in previous studies subject area differences in these correlations have been reported. For example, researchers found a positive relationship between performance expectancy and achievement in mathematics (Peterson et al., 1982), but not



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in reading (Glenberg & Epstein, 1985). Unfortunately research in the subject area of science is somewhat lacking, as a result comparisons are difficult to make. Yet the similarities between mathematics and the sciences are numerous, a fact which could lead one to ask why the relationship between performance expectancy (score predictions ) and academic success (test scores) was so weak in the present study.

In reexamining the Model of Performance Expectancy as A Function of Self- Regulated Learning (Figure 1.0) it was observed that several factors that would influence a student's success on an achievement-related-task factors, were not incorporated into this study, including self-concept of ability, causal attributions, locus of control, sex-role identity and personal experiences, cost of success, and affective experiences. However, other factors which are not necessarily under the individual's control (including emotional state, and physical health) are not incorporated into the model, yet clearly they would also have an influence on student performance (Welborne & Connell, 1990).

The results presented also demonstrated that there was no significant difference in the absolute differences between predicted and actual scores for each test. Thus, there was no significant change/improvement in the accuracy of the expectancy statements at the end of the year as compared to the beginning of the year. Absolute mean differences between predicted and actual scores ranged from 12.7 in Test 1 to 14.6 in Test 3 and finally 10.9 in Test 6. There are a number of possibilities for explaining this variation.

The first and most obvious factor is that related to task difficulty. Although the test format was similar for all six tests, the content varied according to the curriculum strand covered; as a result, the test difficulty was also affected.

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Recent research offers another explanation for the observed variation in the accuracy of expectancy statements. Falchikov and Boud (1989) stated that because the type of tests used and the notion of knowing varies across the domains, test prediction accuracy likely develops at different rates in different content areas. In fact, improvements during the elementary school years in children's ability to assess themselves accurately have been found on tasks such as vocabulary tests, motor skills, and drawing ( Butler,1990). Thus, it is possible that as a result of the challenging subject matter, students struggled to make accurate statements of expectancy.

In relationship to the survey questions, of the students surveyed 38% thought that making score predictions had been helpful in improving their scores. This finding is significant because, as Weiner and his colleagues (1971) proposed, it is an individual's cognitions about the causes for success and failure that affect future task performance. Thus, they postulated that it is not reality per se (actual success or failure) that influences a children's behaviour, but rather children's interpretation of reality (how they thought they did). This was in fact the case for, as several participants stated, their behaviour and future task performance had been positively affected by making score predictions: "Score predictions made me study more and try harder" (Patrick), and "as a result of score predictions I had more confidence in myself" (Janice).

Several trends emerged related to students' perceptions of the improved accuracy of their expectancy statements with practice. Many of these trends were related to students' modifying their approach to performance expectancy, in the form of using different techniques and strategies to make their test score predictions. This self-management is an important part of metacognition and "good learning which involve planning and monitoring--a process of active adaptions to the learning environment" (p.439) (Schraw, Dunkle, Bendixon, & Roedel, 1995).

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Another trend that was observed was students' intentionally recording lower or, in some cases, although less frequently, higher expectancy statements. As Dwek (1975) suggested, an expectancy statement represents a public commitment to a certain standard of performance. The higher the initially stated expectancy, the more likely the student is to perform below the set standard. Thus, students in the study may have reacted to this anxiety and desire for approval by setting low enough standards (i.e., claiming to have low expectations) to assure success (and consequent approval). Other individuals may have selected a "defensive posture" to lessen anxiety by setting higher standards (i.e., claiming to have high expectations) (Covington & Omelich, 1979). The large standard deviations reported in this study may be attributed in part to these factors.

A perceived change in study habits as a result of making explicit performance expectancy was observed and is important, in particular because it reflects that students have placed a higher perceived task value on the science tests. The earlier literature review indicates that there is a positive relationship between effort exerted and task value. More importantly, increased study time directly influences self-concept of ability: as students study more, they become more confident (Aimes & Archer, 1988). This finding is supported by several students' comments, including those of Simon, who explained that his confidence level had increased as a result of studying more and making more accurate predictions.

Researchers have identified several emerging factors which must be examined, factors that may have influenced students' honesty in recording the number of minutes they studied. As Butler (1990) explains, students who are less confident in a particular subject area may adapt by pretending to exert the minimal effort necessary to get by. The strategy of feigning not trying

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(hence, not studying, or studying very little) provides "an easy excuse for failure and lessens the need to attribute subsequent poor performance to inability" (p.206). This strategy has two advantages. First, it prevents out-and-out failure; second, it provides the student with face-saving attribution for lack of success, namely, "I didn't do better because I didn't try as hard as I could have." Psychologists have argued that this attribution is psychologically less costly than the attribution to lack of ability that one would have to make if one had tried as hard as one could have and had still not "succeeded" (Zimmerman et al., 1992). Thus, it is possible that the actual measure of improvement in study habits is underestimated.

**Recommendations**

The data in this study suggest the following recommendations:

1. That teachers incorporate into classroom activities the explicit use of performance expectancy as a function of self-regulated learning. Although no statistical significance was demonstrated students' perceptions indicate that performance expectancy fostered intrinsic motivation, in the form of students' perceptions of improvements in study habits and increased confidence levels. As Cantwell & Moore (1996) explain, it is important that students hold adaptive beliefs about personal control process that incorporate an understanding of the need to flexibly plan and monitor their own cognitive activity.

**Suggestions for Further Research**

Three suggestions for further research are presented in this section.

1. Because this study was done with only one intermediate class consisting of only

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twenty-one students, it would be advisable to replicate the study using a larger sample size and population, and including a control group.

2. This study was done by method data collection and questionnaire only. A more comprehensive study would result if interviews were added and measures of academic self-concept taken.

3. Since measurements for the study were conducted during a single school year, the generalizability of the study was seriously limited. As a result, a more longitudinal study is suggested.

**Conclusion**

With the upsurge of interest in cognitive personality variables as mediators of achievement behaviours, increasing numbers of investigations have routinely begun to employ procedures designed to tap these variables (Eccles et al., 1983). One such procedure involves asking subjects to report their expectancies of success either before they perform the task or before each trial. These expectancies are then related to some aspect of performance, such as accuracy. Several assumptions underlie the use of this procedure. One is that the reported expectancies are simply public records of an ongoing cognitive process. In other words, individuals are assumed to formulate expectancies spontaneously. Yet, as this study attempted to demonstrate, by making this process explicit students will modify their expectancies and study habits over time in particular in light of performance outcomes. Ideally students will continue this process, even when they are not asked to do so.

As Elliot and Harackiewicz (1996) explained, task goals and performance-approach goals

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(in the form of performance expectancies) are grounded in self-regulatory practices that lead to positive outcomes such as the attainment of competence or task mastery. Thus, this use of performance expectancy as a function of self-regulated learning will promote the use of cognitive and self-regulating strategies. As the self-regulation literature has clearly demonstrated, more effective learners possess and use substantial knowledge base about learning that allows them to organize, plan, and monitor most aspects of learning tasks in a generally task-appropriate way (Pintrich et al., 1993). Good learning involves both planning and monitoring; thus, as educators we must assist students in the monitoring of their own learning, particularly through the explicit use of performance expectancy. It is therefore reasoned that further research in this area will lead to results that will be highly beneficial for both students and educators.

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# Appendices



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**Appendix A: Parent/Guardian Letter**

Date

Dear Parent/Guardian

I am a graduate student in the Faculty of Education at Lakehead University. My research is on students' perceptions of "performance-expectancy", study habits, and actual outcomes in science.

As you know, your child has been making score predictions on science tests. I would like to analyze these predictions in relation to actual scores, and survey students' perceptions of the "performance-expectancy" process.

No person other than myself will have access to the information provided. Your child will not be identified by name and I will not use any information from school records. When the study is completed, the information will be securely stored at Lakehead University for seven years and then destroyed. A report of the findings will be made available to interested parents and students at Lakehead University's Faculty of Education Library.

Participation in this study is completely voluntary.
This study has been approved by the Lakehead University Senate Research Ethics Board, the Lakehead Board of Education and by Terry Halabecki, principal at Kakabeka Falls Public School.

If you consent please sign and return this consent form to school by _____.

If you have any questions about the study, please do not hesitate to contact me at 473-9252 or my advisor Dr. Juanita Epp at 343-8722.

Sincerely,

Angelina Tassone



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**Appendix B: Parental/Guardian Consent Form**

## Parental/Guardian Consent Form

Student's Name: _____

Please check one:

☐ I am willing to let my child participate in the Lakehead University Study conducted by Angelina Tassone

I have received an explanation about the nature of the study and its' purpose. I understand the following:

1. My child is a volunteer and can withdraw from the study at anytime.
2. There is no danger of physical or psychological harm.
3. The data provided will remain confidential.
4. A summary of the research findings will be made available at Lakehead University's Faculty of Education Library.
5. The data collected will be kept in file at Lakehead University for the duration of 7 years upon completion of the thesis and then destroyed.

_____ _____
Signature of Parent/Guardian Date

_____ _____
Signature of Student Date



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**Appendix C: Student Survey**

Name : _____ Date: _____

Student Survey

1. Do you think that your scores have improved as a result of making score predictions throughout the year? Explain.

2. Has the accuracy of your predictions improved throughout the year? Explain.

3. Have your study habits changed in anyway as a result of making score predictions throughout this year? Explain.



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