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PSYCHOMETRIC PROPERTIES OF THE MEASURE OF PROCESSES OF
TEACHING
(MPOT)

(Spine title: Psychometric Properties of the MPOT)

(Thesis format: Monograph)

By

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Graduate Program in Education

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Education

The School of Graduate and Postdoctoral Studies
The University of Western Ontario
London, Ontario, Canada

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requirements for the degree of
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Table of Contents

CERTIFICATE OF EXAMINATION.....	ii
ACKNOWLEDGEMENTS.....	iii
TABLE OF CONTENTS.....	iv
LIST OF TABLES	v
LIST OF FIGURES	vi
LIST OF APPENDICES	vii
ABSTRACT	viii
1. INTRODUCTION.....	1
Thesis Objectives and Outline.....	2
2. LITERATURE REVIEW.....	2
Definition of Expertise.....	2
The Nature of Expertise and Expert Knowledge.....	3
Expertise in Education.....	4
Teacher Effectiveness	5
Students' Perceptions of Teacher Effectiveness.....	6
Measures of Teacher Effectiveness.....	8
Measure of Teacher Effectiveness under Consideration.....	11
Measure of Processes of Teaching (MPOT).....	12
Basis for the MPOT format	13
Psychometric Properties of Questionnaires.....	15
Reliability and Validity.....	17
Standards of Reliability and Validity.....	20
Objectives and Predictions	21
3. METHODS	22
Study Design.....	22
Procedure for the Present Study.....	23
4. RESULTS	24
Construct Validity	24
Interpretation of Factors	26
Scale Scores	28
Criterion Validity	28
Reliability.....	30
5. DISCUSSION.....	31
Reliability.....	31
Validity	32
Educational Implications.....	37
Limitations of the investigation.....	39
Future directions and conclusions.....	39
6. REFERENCES.....	41
7. APPENDICES.....	49
8. CURRICULUM VITAE	65

List of Tables

Table 1: Factor Loadings and communalities based on a principal components analysis with varimax rotation for 24 items from the Measure of Processes of Teaching (MPOT) ..	58
Table 2: Factor Loadings and communalities based on a principal components analysis with varimax rotation for 17 items from the Measure of Processes of Teaching (MPOT) ..	59
Table 3: Means and Standard Deviations by sex, Factors 1, 2 & 3.....	60
Table 4: Means and Standard Deviation by Student perception of how well their teacher knows them, Factors 1, 2, 3.....	61
Table 5: Item Means for each Scale	62

List of Figures

Figure 1: Plot of Positive Relationship Mean Scores by Grade.....	63
Figure 2: Plot of Cognitive Engagement Mean Scores by Grade.....	64

List of Appendices

Appendix A: The Measure of Processes of Teaching (MPOT).....	50
Appendix B: Ethics Approval.....	54
Appendix C: Letter of Information.....	56

Abstract

This thesis assesses the psychometric properties of a measure of teacher expertise/effectiveness, The Measure of Processes of Teaching (MPOT). A survey was completed by 142 students (69 boys and 73 girls) in grades 4 to 8. The MPOT demonstrated acceptable levels for test-retest reliability, and internal consistency. Construct validity was assessed using Factor Analysis, resulting in a 17-item questionnaire. Three underlying factors were found, Positive Teacher-Student Relationships, Cognitive Engagement, and Personal Control. The MPOT demonstrates acceptable measurement properties when applied in an educational setting, and when used, would benefit both teachers and students.

Keywords: psychometric properties, teacher expertise, Measure of Processes of Teaching, measurement properties, validity, reliability

Introduction

Expertise in the delivery of education services to children is growing in importance within today's educational environment as the notion of inclusive classrooms affects the complexity of classroom learning. Due to the complexities involved in defining, measuring, and studying expertise, it has been found that in researching this topic there are gaps in our understanding of how to facilitate and support teachers to do and be their best in the classroom. Studies are needed to generate important new knowledge about the factors and processes associated with stability versus change in expertise status, which will add to the understanding of the development of expertise in practice settings (King, Servais, Specht, Bartlett, Gilpin, Petersen & Stewart 2008).

In order to develop a tool to help identify these gaps in knowledge, King et al. (2008) created the Measure of Processes of Teaching (MPOT). The measure was devised to focus on teachers' delivery of information and facilitation of a social learning environment; more specifically, focusing on elementary school students' perceptions of teachers/student interactions, delivery of course material (clarity of teaching, and motivational aspects), and regulating student learning (support/ assistance, and setting appropriate expectations). The psychometric properties of the MPOT have not been examined and therefore will be focused on in this thesis, in order to enable the use of the measure in research.

Thesis Objectives and Outline

This thesis addresses the extent to which the Measure of Processes of Teaching (MPOT) is appropriate for use in education. The objectives of the thesis are to examine the measurement properties of the MPOT and determine its feasibility as a self-administered tool for teachers of children within the grades of 4 to 8. Specifically, this thesis addresses the MPOT's 1) construct validity, 2) internal consistency, and 3) test-retest reliability.

The thesis is organized as follows: a) The literature review offers an overview of teacher expertise, teacher effectiveness, and measures of teacher effectiveness currently in practice, while the remainder of the literature review section provides a basic background to the evaluation of the measurement properties of a standardized measure. b) The methods section outlines the methodology to assess the psychometric properties of the MPOT and c) the final section presents conclusions regarding the applicability of the MPOT in the field of education.

Literature Review

This section provides some background information on expertise, perception and effectiveness, as well as the measures of teacher effectiveness currently in practice.

Definition of Expertise

Based on a review of the literature in the fields of physical therapy, occupational therapy, medicine, nursing, education, and counseling and psychotherapy, King (2009) has defined expertise as "the ability to show appropriate, exceptional, or adaptive performance/behaviour in response to a situation that contains a degree of unpredictability or uncertainty" (p. 395). Expertise is based on a set of content,

procedural, self-knowledge (Goodyear, 1997; Rogers & Holm, 1997), personal qualities and characteristics (i.e., attitudes, values and traits), and skills and abilities (e.g. technical, interpersonal, self-regulation, cognitive, and meta-cognitive skills) (Higgs & Jones, 2000).

The Nature of Expertise and Expert Knowledge

King (2009) states that there is a growing body of literature on the nature of expertise in the professional fields of physical therapy, occupational therapy, medicine, nursing, education and counseling and psychotherapy. Although each field has unique emphases in terms of theoretical traditions, methodologies, and constructs of interest, the literature indicates that experts in diverse fields have very similar characteristics (Berliner, 2004). The defining attributes of expertise across professional fields include differences in self, content and procedural knowledge, as well as differences in personal qualities and characteristics, and skills and abilities (Skovholt, Jennings, & Mullenbach, 2004; Sternberg & Horvath, 1995).

The content knowledge of experts is more comprehensive, elaborate, and complex (Eells et al., 2005). Experts possess a broad, deep knowledge base that enables them to distinguish and selectively use the most critical and relevant information (Ericsson & Lehmann, 1996) and to engage in effective action (Higgs & Jones, 2000; Martin, Slemon, Hiebert, Hallberg & Cummings, 1989). Experts have superior procedural knowledge, which involves knowing “what” to do and “when” to do (Dorner & Scholkopf, 1991). Experts use decision rules and principles (Chi, Glaser, & Rees, 1982; Schön, 1983) and are highly skilled in allocating their attention to things that matter. King, Currie, Bartlett, Gilpin et al. (2007) found that expert therapists facilitate client change using principles of

engagement, coherence and manageability. Expert educators use these principles to maximize classroom learning experiences (Berliner, 2004; King, 2009; Mithaug, Mithaug, Agran, Martin, & Wehmeyer, 2003).

Expertise in Education

Sternberg and Horvath (1995) argue that expertise in teaching incorporates standards, such that not every experienced practitioner is an expert, but there is variability in the profiles of individual experts. The rationale for clarifying an expert teaching prototype is to distinguish teachers who are expert from teachers who are merely experienced at teaching students, in order to inform teacher education practices. The primary assumption for arguing for the use of varying teaching styles is that teaching is made up of very complex thoughts and actions that must be performed immediately (Pressley, Mohan, Raphael & Fingeret, 2007). It is almost impossible to envision the many events, thoughts and options which are studied, interpreted, selected, and understood by a teacher during the course of a typical lesson. Teacher expertise is a complex concept because of the various situations teachers find themselves in on a daily basis. An expert teacher must be able to formulate educational problems, design strategies that fit a particular group of students in a particular setting, and reflect on issues of ethics, policy, and pedagogy that affect daily decisions in the classroom (Shulman, 1987), much like Schön's (1983) ideas of reflection in action with practitioners. He wrote that the heart of this study was 'an analysis of the distinctive structure of reflection-in-action' (p. ix). He argued that it was 'susceptible to a kind of rigor that is both like and unlike the rigor of scholarly work and controlled experimentation' (p. 8). One of the most important parts of teacher expertise is being able to understand the idea of an effective

teacher, and how one can achieve it. Research on effective teachers and classrooms can provide insights into understanding what these educators do to promote the achievement of their students. (Pressley et al., 2007).

Teacher Effectiveness

The environment, climate, atmosphere, tone, ethos, or ambience of a classroom is believed to exert a powerful influence on student behaviour, attitudes, and achievement (Fraser, 1997). A wave of research on teacher effectiveness has emphasized how teacher cognition and decision-making affect the quality of classroom instruction (Palmer et al. 2005). In the last 20 years, educational researchers have explored the construct of teacher expertise, which has its theoretical roots in cognitive psychology, characterizing people as dynamic information-processing systems whose mental operations might be described in computational terms (Berliner, 1994). This research has identified a variety of characteristics and practices of effective teachers. Definitions of teacher effectiveness range in their focus from the actions of the teacher, to the knowledge a teacher possesses, to the creativity of the teacher. Teachers must do far more than present learning activities, manage the class, and provide correct feedback. Chen et al. (2000) believe that as facilitators and guiders, teachers are challenged to:

- (1) encourage students to be autonomous thinkers and to be creative problem setters and solvers;
- (2) encourage students to use higher-order thinking skills to critically reflect on and evaluate their learning;
- (3) guide students to elaborate on their initial thoughts and actions by scaffolding various ways to expand alternative responses;
- (4) help students build a bridge between acquisition and application of knowledge by using metaphors, images, and examples that are

relevant to students' life experiences and prior knowledge; (5) provide students with opportunities to interact with peers and groups; (6) engage students in collaboration, negotiation, discussion, and joint problem-solving activities; and (7) guide students to reflect on class rules and norms, to be sensitive to each other's ideas, and to share ideas with each other cooperatively (p. 28).

Blanton et al., (2006) state that teacher quality is widely recognized as a significant factor in influencing student achievement and success in school.

It is known that certain aspects of teaching are causally related to positive benefits for students. Pressley, Dolezal, Raphael, Mohan, Roehrig, and Bogner (2003) state that teacher caring is one of the most essential parts of effective teaching. They also state that the physical environment and psychological atmosphere should be positive, classroom instruction and content should be full of positivity, and classroom management should be constantly assessed by the teacher in regards to students' engagement, understanding and behaviour during the day. Since these aspects are known to benefit students, incorporating these aspects into their teachings would be an essential part of teacher effectiveness.

Students' Perceptions of Teacher Effectiveness

Education reform must focus on improving teaching and teacher effectiveness. However, the classroom environment necessary to reform education is fundamentally different from what most teachers experienced as students (Doherty et al., 2002). The strongest tradition in classroom environment research has involved investigation of associations between students' cognitive and affective learning outcomes and their perceptions of their teacher (Fraser, 1993). Numerous studies have shown that student

perceptions account for appreciable amounts of variance in learning outcomes often beyond that which can be attributed to student background characteristics. For example better student achievement on a variety of outcome measures was found consistently in classes perceived by students as having greater cohesiveness and goal direction, and less disorganization and friction (Fraser, 1997; Haertel et al., 1981).

Research involving teachers and students informs educators that teachers are likely to perceive the classroom environment more favourably than their students in the same classrooms (Blanton, Sindelar, & Correa, 2006). An interpretation of this is that teachers think that they behave closer to their ideal than their students think that they do. A study by Wubbels (1993) in Western Australia and Tasmania indicated that teachers did not reach their ideal teaching goal and differed from the best teachers as perceived by students. It is noteworthy that the best teachers, according to students, were stronger leaders, more friendly and understanding, and less uncertain, dissatisfied and admonishing than teachers on average. Fisher et al. (1996) gave student feedback to teachers and found that having had time to consider the results supplied to them, teachers reported that they had been stimulated to reflect on their own teaching and verbal communication in the classroom. For example, one teacher concluded that she had become more aware of her students' need for clear communication and that this had become a focus for her in improving her classroom teaching. Knowledge of students' perceptions can be employed as a basis for reflection upon, discussion of, and systematic attempts to improve classroom environments (Fraser, 1997). Student's perceptions can be used for teachers to better utilize their professional development, through measures of teacher effectiveness that investigate the key constructs associated with student

achievement, such as delivery of course material, perceptions of student teacher interactions and regulating student learning.

Measures of Teacher Effectiveness

How can one justify having empirical objective measures about such an elusive, non-measurable, existential human relational phenomenon as human caring in educational practice? This is the question that one hears within educational circles. The very paradigm in which caring is located, with its ambiguity and ubiquitous nature, as shown in the caring theory literature, has tended to make caring almost immeasurable, practically, unless there are some quantitative standards that seek to capture its elusive, phenomenological, subjective dimensions (Watson, 2009).

Measuring teacher effectiveness is a thorny issue—methodologically, practically, and politically. A teacher's impact on student achievement can be measured in many ways, with different results depending on the learning measured or the instrument used to measure it. Many researchers argue for using standardized assessments to measure student learning and, thus, teacher effectiveness (Toland & DeAyala, 2005). For policy purposes, standardized tests are currently the best objective and quantifiable measure of student learning available (Pressley et al., 2007). Although not perfect, tests are certainly better measures than what is currently used to judge and to reward teachers—haphazard and irregular evaluations and qualifications, which are proxies for effectiveness (d'Apollonia & Abrami 1997).

Much research has been done on measures of students' evaluations of teaching, predominantly in a secondary and post-secondary setting. According to Marsh (1987) one of the key purposes of student evaluations of teaching is providing feedback that might

lead to better teaching skills. The evaluation of teachers by their students has in fact been widespread on college campuses for many years. Many researchers have concluded that the reliability and validity of student ratings are generally good and that student ratings are the best, and often the only, method of providing objective evidence for summative evaluations of instruction (d'Apollonia & Abrami 1997).

A measure of students' evaluations of teaching that is greatly supported is the Students' Evaluation of Educational Quality (SEEQ) questionnaire developed by Marsh and colleagues (Marsh, Fleiner, & Thomas, 1975). This measure contains 35 questions that capture nine aspects of teacher effectiveness. The nine criteria of evaluation are learning/value, enthusiasm, organization, and group interaction, and individual rapport, breadth of coverage, examination/grading, assignments, and workload/difficulty. These nine dimensions have been supported in various other studies. (Toland & DeAyala, 2005).

Abrami, d'Apollonia and Rosenfield (1996) proposed the students' evaluations of teaching model, not only looking at university students, but secondary students as well. These researchers used multivariate meta-analysis techniques to identify common factors across students' evaluations of teaching instruments, and found four components. The first was labeled "instructor's role in delivering information" including statements of overall course and instructor ratings, clarity, presentation, organization, monitoring, and the instructor's enthusiasm. The second factor was labeled "instructor's role in facilitating a social learning environment", which contained statements of concern for students, the availability of the instructor, respect for students, and diversity and friendliness of the classroom atmosphere. The third factor was named "instructor's role in

regulating student learning”, and consisted of statements about teacher feedback and evaluation. The fourth factor was not given a label but was comprised of a mixture of statements about the instructor’s knowledge of course content and class materials, and the use of instructional objectives.

Feldman (1976) developed a theory of roles of an effective instructor, namely, Stimulation of Interest; Clarity (understandableness); Knowledge of Subject Matter; and Instructor's Enthusiasm for the Subject Matter or for Teaching. d’Apollonia and Abrami (1997) extended the research of Abrami et al. (1996) by discussing how the factors they had found were similar to that of Feldman’s, when the third and fourth factors were combined. Abrami et al. also conducted an analysis which concluded that student’s ratings of teaching effectiveness did indeed measure general instructional skill (GIS), confirming other research results indicating that there is a global measure of instructional skill. The GIS consisted of three instructional skills: the delivery of instruction, the facilitation of interactions, and the evaluation of student learning. These three skills correspond to the ideas of Feldman (1976) and d’Apollonia & Abrami (1997) and extend their theories, as delivery of instruction and the facilitation of interactions is prominent in past research. However, evaluation of student learning was an addition to the body of literature in effective teaching research.

Toland and DeAyala (2005) built on the work of Abrami et al. (1996) and d’Apollonia & Abrami (1997). To test the three factor model created by d’Apollonia and Abrami, Toland and DeAyala developed a new measure, the Students’ Evaluation of Teaching Effectiveness Rating Scale (SETERS). The SETERS measures the level of teaching effectiveness on three factors: Instructor’s Delivery of Course Information (e.g.,

enthusiasm, presentation, organization, clarity), Teacher's Role in Facilitating Instructor/Student Interactions (e.g., group interaction, rapport, understanding learners' backgrounds, ethnicities, and attitudes), and Instructor's Role in Regulating Students' Learning (e.g., exams, assignments, readings and quizzes). The SETERS was geared toward university students, and therefore it is not relevant when including the idea of regulation of learning when wanting to use the elementary school age group.

Research on teacher effectiveness and student evaluation of teaching in an elementary school setting is scarce. Pressley et al. (2003) have carried out grounded theory analyses of effective elementary instruction, and state that one response to the relative lack of research in elementary-grade students compared to secondary students is that there is no need to study teacher effectiveness in the elementary grades. In response to this, more and more research is being generated specifically as to why teacher effectiveness and student evaluation of teaching is important in an elementary school setting. This study is another contribution to this idea of teacher effectiveness and student evaluation of teaching.

Measure of Teacher Effectiveness under Consideration

The lack of knowledge in this field as noted above, led King, Servais, Specht, Bartlett, Gilpin, Petersen and Stewart (2008) to develop a long-range plan to investigate and understand the experiences that support expertise development. The interest in this relationship stems from the desire to discern how to improve the delivery of education services for the student population. If certain aspects of teaching are clearly and causally related to the benefit of students, then educators should make sure to incorporate these aspects in their classroom and teachings.

Several of these measures demonstrate some or provided adequate evidence of reliability and validity, but they did not meet the needs of King, Servais, Specht, Bartlett, Gilpin, Petersen and Stewart (2008). There has been much research done on student evaluations of teachers but not of perceptions of expertise, focused on behaviours, especially with students in an elementary school setting. Measures that address general satisfaction such as the SEEQ are not suitable for studying the process of teaching on a behavioural level. Abrami et al.'s students' evaluations of teaching does somewhat reflect specific behaviours of the teacher, but this questionnaire was not fully congruent with King et al.'s interest, as it is not solely focused on educator behaviours. Pressley et al. (2007) developed a list of standards and specific indicators of these standards relevant to the provision of educational services for students. While Pressley et al. (2007) state that these indicators may be useful in assessing the quality of teaching being delivered, the list was not designed as a measuring device, and thus there is no evidence of reliability or validity.

Measure of Processes of Teaching (MPOT)

King et al. (2008) wanted to develop a measure that showed the behavioural and interactional aspects of professional activities (rather than the structural or specific content aspects of the services). The measure was designed to focus on the teacher-student relationship, which makes students feel, think and behave in different ways. Behaviours that can be modified or changed were focused on, to determine whether specific components of behavioural mannerisms were beneficial or not to the student population. The MPOT was developed based on the Measure of Processes of Care (MPOC) designed by King, Rosenbaum, and King (1996). The framework and the items

in the SETERS (Toland & DeAyala, 2005) were used as a basis to help create the MPOT. King et al. (2008) realized there were a handful of measures of teacher effectiveness, but were after a measure that was comparable to the MPOC because of their interest in cross sector study of expertise. The MPOC was designed to be completed by clients in the rehabilitation field, (the parents of the children in therapy), and the thought was to have the 'clients' in the classroom, namely, the students, completing the MPOT themselves, so a similar measure would be ideal to create for research study purposes.

Basis for the MPOT Format

The MPOT was derived from King et al. (2008)'s MPOC and Toland and DeAyala (2005)'s SETER. As stated previously. King et al. wanted to parallel the subscales from the SETER: Instructor's Delivery of Course Information (e.g., clarity of teaching, motivational aspects), Teacher's Role in Facilitating Instructor/Student Interactions (e.g., group interaction, rapport, understanding learners' backgrounds, ethnicities, and attitudes), and Instructor's Role in Regulating Students' Learning (e.g., support/ assistance, and setting appropriate expectations). The MPOC is a 56-item self-administered parent questionnaire which measures parents' perception of the family-centeredness of the services they and their child receive in the rehabilitation field. Items are arranged in five scales: enabling and partnership; providing general information; providing specific information; coordinated and comprehensive care; and respectful and supportive care. Items are scored on a 7-point scale, from a behavior 'never' occurring (1) to 'occurs to a great extent' (7). A response of '0' indicates that the item was 'not applicable'. A mean is calculated from the raw item scores for each scale to give a mean scale score. Studies have shown good reliability and validity (Knox & Menzies, 2005).

King et al. (1997) have stated that the MPOC was developed as a discriminative measure, rather than as an evaluative tool. The initial interest was to be able to discern variations in parental experiences and perceptions of care and services received, and to assess whether styles of care are viewed differently as measured by the MPOC (King et al., 2008).

King et al. (2008) wanted to combine the structure of the MPOC and the framework and items in the previously mentioned student report measures of teaching effectiveness. The MPOC was geared toward parent's perceptions. When it comes to education, parents cannot assess the behavioural/interactional relationships of teachers and students, as they typically do not have enough contact with the teachers. Therefore it was logical to develop a student-report measure, for school age children ages 8 and up. Another reason King et al., (2008) decided to use this age group as a focus for the MPOT was that developmentally, these students can step into another's shoes and view themselves as others do, knowing that others can do the same. It was agreed by King et al. that the MPOT needed to focus on indicators that make sense to elementary school children, such as enthusiasm, and teacher knowing their material, teacher caring about them, teacher being able to teach, and teacher liking them or understanding / respecting them, much like Pressley et al. (2003) found made for effective teachers. The measure also needed to grab ideas such as 'listens to me' and 'understands me'. It was also decided that the conceptual basis to the measure would be individualizing, controlled, coherent and engaging. Another idea was that the principles of change might underlie the conceptualization of the measure (Toland & DeAyala, 2005). It was also agreed upon that the measure needed to be short and evidence based.

Initial research of the MPOC indicated that parents preferred a response scale, with items such as “very much like my child” to “not at all like my child” scale rather than an agreement scale and that it worked better than the agreement scale. Using that response scale format for the MPOT paralleled the 7-point MPOC scale. King et al. (2008) decided to use a response scale such as “very much like my teacher” to “not at all like my teacher” on a 7-point Likert-type scale. The main reason for choosing the Likert-type scale is its ease of use. Likert scales are not difficult to use because the end result is a scale mean, which is easily converted to a continuous score. The teaching quality component is easy to communicate, even to a non-statistically trained target public (e.g. elementary school students). Another advantage of Likert scales is the ability to test each scale for reliability by means of the Cronbach’s alpha statistic. Again, the interpretation of this statistic is far from complicated (an alpha value higher than 0.70 indicates a reliable scale) and as a consequence is easily communicated to a broader community of users (Spooren, Mortelmans & Denekens, 2007). It was also decided to use wording in present tense, instead of past tense, and items were reworded so younger children would be able to understand them.

In previous work a preliminary version of the MPOT rating scale was pilot tested on approximately 20 students, ranging in age from Grade 4 to Grade 6. The children were recruited through friends and acquaintances, who helped recruit more children by word-of-mouth. The majority of the students completed the MPOT in a library public meeting room, in the presence of some peers and parents. Students were asked to read the instructions printed on the MPOT; however they were also verbally instructed and were advised that they were able to ask for clarification or help at any point. The measure took

8-15 minutes to complete, averaging approximately 10 minutes. Students' feedback on these items was summarized and used to adjust some of the existing items for wording. Most students reported that they found the MPOT easy to understand and easy to answer honestly and accurately. Parents were also very excited about the opportunity for their children to express their opinions about their teachers.

Developing a new measure requires the construction of the instrument and a determination of its accuracy (Doherty et al., 2002). The next step is to determine the validity of interpretations made from data gathered by the measure. Now that this tool has been developed it is in need of assessment of its psychometric properties. Reliability and validity are needed in order for a measure to be credible.

Since there was no reliable and valid measure suitable for their purposes, King et al., (2008) undertook to develop a Measure of the Processes of Teaching (MPOT) for use in subsequent investigations. While there are reliable and valid outcome measures available to measure teacher expertise, this research group wanted to focus on the way educators delivered their information and facilitated a social learning environment, from the perspective of an elementary school child.

Psychometric Properties of Questionnaires

When choosing a questionnaire, it is important that it has adequate reliability and validity (Zeller, 1997) in order to ensure that decisions made based on its results are appropriate. Thorndike and Thorndike, (1997) stated that "the measurement process involved in clinical activities is dangerous but inevitable" (p.779). The dangers of measurement can be reduced if the tool being used has good reliability and validity.

These issues are generally addressed when a new test or measurement procedure is introduced to the scientific community (Zeller, 1997).

Reliability and Validity

Reliability is the extent to which a measurement is consistent and free from error (Portney & Watkins, 2000.) Validity is the “overall evaluative judgment of the degree to which empirical evidence and theoretical rationales support the adequacy and appropriateness of interpretations and actions based on test scores or other modes of assessment” (Messick, 1994, p. 4).

Reliability.

Reliability refers to “the consistency of scores obtained by the same persons when reexamined with the same test on different occasions, or with different sets of equivalent items, or under other variable examining conditions” (Dominy & Marshall, 1995, p. 18) In other words, the reliability of an instrument indicates how consistent the test is. Reliability is usually referred to as test-retest reliability, and internal consistency. Test-retest reliability is the repeatability of a test over time, specifically whether the same result is obtained when the same questionnaire is completed a second time within a specified period over which no change is expected (McDowell & Newell, 1996). Administration of the scale is completed on two separate occasions separated by a time interval that is sufficiently short so the underlying process is unlikely to have changed (Thorndike & Thorndike, 1997). The scores obtained on the two administrations are then correlated to determine the reliability coefficient. Reliability coefficients range from .00 (no correlation or reliability) to 1.00 (perfect correlation or reliability). The higher the reliability, the less susceptible the scores are to random daily changes in the condition of

the test takers or of the resting environment. When a test is shown to have high test-retest reliability, one can be more certain that any difference in test scores on separate administrations of a test are due to actual differences and not measurement error (Dominy & Marshall, 1995).

Internal consistency is a measure of the extent to which all items in a multiple item evaluation system measure the same attribute (Nunnally & Bernstein, 1994). Item internal consistency reliability is used to determine the degree of homogeneity of items in an instrument or scale—the extent to which responses to the various components of the instrument correlate with one another or with the score on the instrument as a whole. Eliminating redundant items within a measure, allows only the items deemed appropriate for the measure (Thorndike & Thorndike, 1997). Indices are derived from item correlation. A positive correlation indicates that the items are measuring a common characteristic. One widely used measure of internal consistency is Cronbach's alpha. Alpha represents the average interitem correlation that being the intercorrelation of one item to all other test items (Marshall, 1995).

Validity.

The validity of a test concerns what the test measures and how well it does so. A valid instrument measures what it was intended to measure.

Content validity indicates that the items comprising an instrument adequately sample the universe of content that defines the variable(s) being measured. This is a subjective assessment of whether the test contains all of the elements that reflect the variable being studied. It is determined by expert judgment and requires both item validity and sampling validity (Portney & Watkins, 2000).

Criterion validity is determined by relating performance on a test to performance on another criterion.

Construct validity is the term used to describe linking an attribute being measured to another attribute by a hypothesis or construct (Zeller, 1997) and is used when there is no gold standard (McDowell, 2006). Constructs are not directly observable, and exist only as concepts representing an abstract trait (Nunnally, & Bernstein, 1994). Construct validity begins with a conceptual definition of the variable to be measured, indicating the structure of the components and the way each construct relates to another construct (McDowell, 2006). Thus, construct validity supports the ability of an instrument to measure a construct and the degree to which the instrument reflects the theoretical components of that trait (Portney & Watkins, 2000). The measure is viewed as an extensible set of indicators for the construct (Messick, 1994).

One method of determining construct validity is through factor analysis. Factor analysis (FA) is a statistical approach that can be used to analyze interrelationships among a large number of variables and to explain these variables in terms of their common underlying dimensions (factors) (Hair et al., 1992). Analysis of the resultant factors, the percentage of variance accounted for by the factors, the pattern of items loading on each factor, and the relationships among the factors can inform instrument development and refinement decisions. Theory and conceptual frameworks provide the structure against which the resultant factor structure can be compared. The more the factors make conceptual sense and are related to theory, the more confident one can be that the instrument has construct validity (Watson, 2009). FA provides three types of information: the number of factors needed to account for the interrelations among data,

what factors determine performance on the test, and what proportion of the variance in the scores is accounted for by these factors (Marshall, 1995).

Standards of Reliability and Validity

When assessing the reliability or validity of a measure, the question of how high the correlation coefficient should be is often raised. The answer to this question will depend on the purpose of determining reliability or validity. Thorndike and Thorndike (1997) state that the most important consideration in determining the acceptability of a given reliability coefficient is the type of decisions made on the basis of the scores and the possible consequences of the decisions. They suggest that relatively low coefficients are acceptable in the early stages of research, whereas higher reliabilities are needed when the measure is used to determine differences among groups. When scores are used for making important decisions about individuals, such as selection and placement decisions, reliability scores should be very high. It is the user's decision as to the amount of error he or she is willing to accept, given the specific circumstances of the study.

Some specific guidelines have been developed to aid the researcher in determining the range in magnitude of the correlation coefficient they are willing to accept. Zeller (1997) reported the following generally accepted values of correlation coefficients for reliability and validity: a correlation coefficient of .30-.50 is considered to indicate moderately low reliability or validity; a coefficient of .50-.70 demonstrates moderately high reliability or validity, and a correlation coefficient greater than .70 indicates very good reliability or validity.

The quantification of reliability and validity warrants some elaboration. Reliability is concerned with consistency and can easily be expressed using numbers. Estimates of

reliability are simple to determine and thus standards can be established, as stated above. The concept of validity is more elusive as it is concerned not with the numbers themselves but with their interpretation. There are no established standards due in part to the difficulty in quantification. Zeller (1997) stated that validity is typically built in to a test from the outset of its development, beginning with the hypotheses that guide the early developmental stages. She also maintains that the interpretive meaning of a test's scores, or its validity, can continue to be refined and enriched after the test is released. Standards of validity are therefore more flexible than those of reliability.

Objectives and Predictions

This study will examine test-retest reliability, internal consistency, correlations and validity of the Measure of Processes of Teaching. It was hypothesized that three factors (Teacher/Student Interactions, Delivery of Course Material, and Regulating Student Learning) would emerge, mirroring the three a priori conceptual domains of the MPOT. Furthermore, perceptions of how students felt their teacher knew them were also expected to be different, with students answering that their teachers knew them "very well" scoring higher on the MPOT than those answering "somewhat well" or "not very well" based on the students' views of caring relationships (Birch & Ladd, 1996). Developmentally, students across grades 4 to 8 differ emotionally, so it was hypothesized that there would be a significant difference between the answers of students in five grades, with students of the younger grades scoring higher on the MPOT, as they still view their teachers as nurturers (McClure, 2000). It would also be expected that there would be a difference in responses between the sexes of the students, as females are

focused more on emotional relationships (Strough & Berg, 2000), they would be likely to score higher on overall scores of the MPOT.

Methods

Study Design

In order for the Measure of Process of Teaching (MPOT) to be deemed credible, this study will be looking at the psychometric properties of the MPOT. When analyzing the reliability of the MPOT, test of internal consistency, using Cronbach's coefficient alpha and test-retest, Spearman Rank correlation, rho, will be used. For investigation of the validity of the MPOT, construct validity will be assessed using factor analysis.

Participants.

Students were drawn from 11 inclusive classrooms in four randomly selected schools from a school board in southwestern Ontario, and ranged in grade from 4 to 8. Schools were randomly selected to participate. Two of the four contributing schools were rural and two were urban schools; by observation, all seemed similar in social economic status.

The sample size of the 142 participating students was based on general guidelines requiring 5-10 subjects per variable or item in order to conduct the planned multivariate analyses (Norman & Streiner, 1986; Nunnally & Wilson, 1975). Considering the MPOT had 24 items, a sample of between 120 and 240 students was sought. Of the 142 student participants, 69 were male and 73 were female. Of the students, 36 were in Grade 4, 37 were in Grade 5, 23 were in Grade 6, 27 were in Grade 7 and 19 were in Grade 8. Sixty-seven students (29 boys and 38 girls) were selected to participate in the test-retest reliability aspect/study. Eleven were in Grade 4, 15 were in Grade 5, 7 were in Grade 6,

19 were in Grade 7 and 14 were in Grade 8. Sixty seven students were chosen as it was approximately 45 percent of the sample surveyed, and was shown to be representative of the sample.

Materials.

Measure of Processes of Teaching (MPOT).

The MPOT was developed by King et al. (2008) in order to measure students' perceptions of their teachers in 3 areas: Instructor's Delivery of Course Information (e.g., clarity of teaching, motivational aspects), Teacher's Role in Facilitating Instructor/Student Interactions (e.g., group interaction, rapport, understanding learners' backgrounds, ethnicities, and attitudes), and Instructor's Role in Regulating Students' Learning (e.g., support/ assistance, and setting appropriate expectations). The MPOT consists of 24 statements grouped into 3 domains (a priori scales) rated on a 7 point Likert-type scale, with response choices ranging from 1 – '*not at all like my teacher*', to 7 – '*exactly like my teacher*'. Higher scores reflect higher perceived teacher expertise. (See Appendix A).

Procedure for the Present Study

After receiving ethical approval (see Appendix B), the school board and schools were approached. Data was collected after the preliminary progress reports from the schools had been distributed to students. This timing/position was based on the rationale that if a teacher had enough knowledge of a student to evaluate them at that point, a student would be capable of having valid perceptions about his/her teacher. Permission from the parents of the children was obtained using a consent form, included with a package which went home with an informed consent form, and a letter explaining the

purpose of the study, together with an email address which allowed parents and students the opportunity to request additional information pertaining to the study and its findings (see Appendix C). The MPOT was distributed to the students of the participating teachers. The data collection periods for all students were one, 15 minute classroom period. Sixty-seven students were selected to participate in the test-retest reliability, and an additional 15 minute classroom period (repeating the process) was utilized, approximately 2 weeks later. An interval of about two weeks between completion of the MPOT at Time 1 and Time 2 was planned, as it was thought unlikely that students would recall their responses on the items by the time of the second test. Also, it was not expected that students' responses would be greatly influenced by new experiences with teachers during this time interval.

Results

Construct Validity

As previously mentioned, factor analysis was used to establish the validity of scale construction, (number and nature of the scales), in this study. Factor analysis, using the principal components procedure, was undertaken. Factor analysis is a method of determining what underlying constructs are subsuming the variables (Watson, 2009). All questions from the MPOT were included in the factor analysis. As stated previously, it was hypothesized that three factors (Teacher/Student Interactions, Delivery of Course Material, and Regulating Student Learning) would emerge, mirroring the three a priori conceptual domains of the MPOT. Three factors were then forced based on the theoretical background of the questionnaire during factor analysis.

Factor analysis was performed on the 24 questions in the MPOT. A varimax rotation was used, so that for each factor, high loadings (correlations) would result for a few variables, and the rest would be near zero. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) of 0.93 indicates that the data is appropriate to perform a factor analysis. Tabachnick and Fidell (2007) recommend that only factors with an eigenvalue of 1.0 or more should be retained for further investigation. Three components were produced having values over 1.0. Component 1 had an eigenvalue of 12.34, accounting for 51 percent of variance; component 2 had an eigenvalue of 1.34 accounting for 5.6 percent of the variance; and the third component had an eigenvalue of 1.03 and 4.3 percent of variance. Following the guideline that a good item has significant factor loadings on one and only one common factor (Cattell, 1988) and based on the guideline of Comrey and Lee (1992) that loadings in excess of 0.55 are good, this figure of 0.55 was used as the choice of cutoff size for the factor loadings, thus eliminating several items. A second Factor analysis was then performed on the 19 remaining items in the MPOT, forcing three factors.

In this second FA, A KMO of 0.92 was produced. Again, 3 components were produced having eigenvalues over 1.0. Component 1 had an eigenvalue of 9.69, accounting for 51 percent of variance; component 2 had an eigenvalue of 1.27 and a variance of 6.7 percent; and the third component had an eigenvalue of 1.01 and 5.3 percent of variance. As previously noted, the cutoff size of the factors of 0.55 was used and eliminated an additional 2 questions.

A third factor analysis was then performed on the 17 questions in the MPOT, again forcing three factors, in order to have all questions loading on one factor at 0.55. A

total of 3 components were produced, all having values over 1.0. Scale 1 had an eigenvalue of 4.98, accounting for 29.3 percent of variance; Scale 2 and an eigenvalue of 3.06 accounting for 18.0 percent of the variance; and the third Scale had an eigenvalue of 3.02 accounting for 17.8 percent of the variance. The data had a KMO of 0.93. The first factor was comprised of 8 questions; the second factor was comprised of 4 questions, and 5 questions constituted the third factor. All questions loaded on one factor at 0.55 or more. See Tables 1 and 2 for the initial and final factor loadings respectively.

Interpretation of Factors

With the selection of the questions to be retained in the MPOT, the factor labels needed to be reworked. Although still working with the ideas of Teacher/Student Interactions, Delivery of Course Material, and Regulating Student Learning, King, Servais, Specht, Bartlett, Gilpin, Petersen, and Stewart decided to re-label the factors Positive Teacher-Student Relationship (8 items), Cognitive Engagement (4 items), and Personal Control (5 items). Factor 1, Positive Relationships, measures the degree in the present tense to which the student sees that there is a positive relationship between the teacher and student, where the teacher shows understanding, is encouraging, accepting and caring. Questions that loaded highest in Factor 1 were 7) explains things to me clearly, 14) encourages me to do my best, 3) understands me as a person, 2) treats me fairly, 4) accepts me for who I am, 8) helps me understand the material, 13) motivates me to learn, and, 1) cares about me. It is easy to see how all of these questions can be perceived as part of a positive relationship, and while still being related to King et al.'s idea of Teacher/Student Interactions.

Factor 2, Cognitive Engagement, measures the student's perception of the teacher's belief in the student. Questions that loaded highest in Factor 2 were 23) believes that I can learn, 21) expects me to do my best work, 22) encourages me to try my best, and, 20) cares if I am not doing as well as I should. This Factor required the most modification. It was originally titled Regulating Student Learning, and fit well with the other questions King et al. (2008) had considered be a part of this factor. In looking at the students' answers on the MPOT, it seemed that the students viewed this regulation of student learning in terms of an approach where the students focused on the teacher's beliefs in their ability to change cognitively, related to words such as encourages, cares and believes, rather than regulating learning with rubrics and feedback.

Factor 3, Personal Control, measures the degree to which the student feels the teacher makes learning relevant, encourages the student's self-efficacy or self-determination, and provides feedback, gives choices, sets expectations and relates lessons to the student's life. Questions that loaded highest in Factor 3 were 24) gives me feedback on how well I am learning, 12) relates information presented in class to my life, 10) gives me choices, 9) uses different ways to help me learn, and, 17) gives me a marking outline. This factor was originally named Delivery of Course Material, and the students seemed to perceive most of the original questions loading on this factor. The interesting divergence was that students identified 'giving a marking outline' (Question 17) and 'giving feedback on how well I am learning' (Question 24) as modes of delivery of course material along with giving the students choices.

Scale Scores

Scale scores were calculated for each respondent, by averaging the scores of each of the scales. Since the MPOT scale is 1 to 7, with 7 being 'exactly like my teacher', and 1 being 'not at all like my teacher' points were assigned as follows: If the answer was 1, 1 point was assigned, if the answer was 2, 2 points were assigned, through to 7, where if the answer was 7, 7 points were assigned. Once each question had assigned points, scales were computed. Each respondent had a scale score for each of the 3 scales, where the first scale would be the mean of questions 1, 2, 3, 4, 7, 8, 13 and 14, the second subscale would be the mean of questions 20, 21, 22 and 23, and the third subscale would be the mean of questions 9, 10, 12, 17, and 24. Each of these scale scores were used in the following analyses.

Criterion Validity

In order to assess group differences that might be expected analyses of variances were conducted.

Grade Differences.

Developmentally, students across grades 4 to 8 differ emotionally, so it was hypothesized that there will be a significant difference between the answers of students in five grades. A one-way analysis of variance (ANOVA) was used to test for differences among grades in terms of students' mean scores on the MPOT scales. Responses differed significantly across the five grades for Scale 1 - $F(4, 137) = 4.95, p = .001$, for Scale 2 - $F(4, 137) = 4.98, p = .001$, but not Scale 3 - $F(4, 137) = 2.26, p = .065$. Tukey post-hoc comparisons on the two significant factors indicate that with Scale 1, Grade 6 differed significantly from Grade 4 ($M = -7.75, 95\% \text{ CI } [-13.58, -1.92]$), $p = .003$, and differed

significantly from Grade 8 ($M = -7.56$, 95% CI $[-14.33, -0.79]$), $p = .020$. Tukey post-hoc comparisons indicate that with Scale 2, Grade 6 differed significantly from Grade 4 ($M = -4.24$, 95% CI $[-7.42, -1.05]$), $p = .003$, from Grade 5 ($M = -4.17$, 95% CI $[-7.33, -1.00]$), $p = .003$, from Grade 7 ($M = -3.84$, 95% CI $[-7.22, -4.56]$), $p = .018$, and also from Grade 8 ($M = -5.13$, 95% CI $[-78.82, -1.43]$), $p = .002$. See Figures 1 and 2 for the mean plots of the differences between grades for Scale 1 and 2.

Sex Differences.

It was also expected that there would be a difference in responses between the sexes of the students. An independent t-test was used to determine whether there was a difference in answers on the MPOT between male and female students. Levene's Test for Equality of Variances indicated that there were not equal variances between the sexes. A significant difference between boys and girls was revealed on questions pertaining to Scale 1 ($t(115.3) = -2.05$, $p < .001$), with girls having significantly higher scores than boys. Scale 2 produced similar differing results ($t(118.6) = -2.36$, $p < .001$), with boys having significantly lower scores than girls. However, Scale 3 produced no significant differences between the sexes ($t(129) = -1.26$, $p = .210$). See Table 3 for a summary of the means and standard deviations from the analyses of variance.

Knowledge.

Furthermore, perceptions of how students felt their teacher knew them were also expected to be different, with students answering that their teacher knows them 'very well' obtaining higher scores on the MPOT. An independent t-test was used to determine whether there was a significant difference in the scales as a function of students' perceptions of how well their teacher knows them. Three categories ('very well',

'somewhat well', and 'not at all') were provided to the students but because of a low N (4) the third category ('not at all') was not included in the t-test. Using Levene's Test for Equality of Variances it was found that there were not equal variances between Scale 1 and Scale 2, yet for Scale 3 equal variance resulted. There was a significant difference between categories on items pertaining to Scale 1 ($t(116.7) = 4.51, p < .001$), with students answering 'very well' having significantly higher scores than those answering 'somewhat well'. See Table 4 for a summary of the means and standard deviations from the analyses of variance. Scale 2 produced similar results ($t(100.6) = 3.15, p < .001$), with students answering 'very well' having significantly higher scores than those answering 'somewhat well'. Scale 3 produced significant results as well ($t(136) = 3.16, p = .002$), with students answering 'very well' having significantly higher scores than those answering 'somewhat well'.

Reliability

Since this study is concerned with the estimation of the internal properties of the MPOT, two-sided 95% confidence intervals were used to quantify estimation uncertainties (Herzberg, 1983). This was the strategy for both internal consistency and test-retest reliability. Correlation coefficients with 95% confidence intervals were also used to evaluate student responses.

Internal Consistency.

The questionnaires completed by all students in the first administration were used to assess internal consistency. The strength of the correlation for assessments used conventional guidelines for interpretation; where 0.30-0.50 is a fair correlation, 0.5-0.70 is a moderate-to-good correlation, and 0.70 and higher is a very good-to-excellent

correlation (Nunnally & Bernstein, 1994; Zeller, 1997). In order to assess internal consistency, Cronbach's alphas on all three factors were calculated. High internal consistency, suggesting that the scales are cohesive, was found, reflected by the alpha values of 0.91 for Scale 1, 0.83 for Scale 2, and 0.84 for Scale 3. See Table 5 for a summary of the item means and standard deviations.

Test-Retest Reliability.

Two week test-retest reliability was evaluated for the 17 item questionnaire. The correlation coefficients using Spearman's rho were calculated to be 0.71 for Scale 1, 0.76 for scale 2, and 0.63 for Scale 3. According to Nunnally and Bernstein (1994) and Zeller (1997) the strength of the correlation for assessments using Spearman's rho are; 0.30-0.50 being fair, 0.5-0.70 is moderate-to-good correlation and 0.70 and up is a very good-to-excellent correlation. Therefore, the scales have adequate test-retest reliability.

Discussion

The purpose of this study was to determine the psychometric properties of the Measures of Processes of Teaching (MPOT). Overall, the MPOT demonstrated sound psychometric properties with intended users. The reliability and construct validity data are discussed below in detail.

Reliability

For the present sample of students the results showed high levels of test-retest reliability on the scales. These results indicate that similar responses will be obtained on the MPOT scales when administered to the same person at different times. Therefore any changes in responses can be interpreted as changes in teacher behaviour or student perceptions of teachers, and not simply random fluctuations or measurement error.

Internal consistency analyses revealed high Cronbach's alpha coefficients for the MPOT scales. Also the 3 factors showed high levels of internal consistency. These results suggest that the conceptual categories are indeed cohesive units and that the items in the scales measure the same characteristic. With evidence from the test-retest and internal consistency, there is evidence that the MPOT is a reliable measure.

Validity

Through factor analysis three factors were revealed for the MPOT. After these three factors were forced three underlying constructs emerged; the first measured Positive Relationships between the teacher and student, the second measured Cognitive Engagement, and the third measured Personal Control. This differs slightly than the original constructs devised by King et al. (2008), as discussed below.

Research has found significant associations between aspects of teacher-student relationships and children's behavioural and academic adjustment at school (Berliner, 2004, Birch & Ladd, 1996). Specifically, the quality of teacher-student relationships has been shown to be an important predictor of students' behavioural and scholastic competence in elementary school years (Pianta, Steinberg, & Rollins, 1995; Wentzel, 2002). King et al. (2008) decided to focus on these relational aspects of teaching, focusing on the teacher-student relationship, and what makes the student think, feel and behave in particular ways. While using the SETERS (Toland & DeAyala, 2005) and ideas of student evaluation of teaching (Abrami et al., 1996), and roles of instructors, (Feldman, 1976) as frameworks, King et al., settled on 3 factors to test in the Measure of Processes of Teaching (MPOT), these being: Teacher/Student Interactions, Regulating Student Learning, and Delivery of Course Material. Teacher/ Student Interactions

centered on how the student feels the teacher cares about them or treats them, while Delivery of Course Material focused on clarity of teaching and motivational aspects. Regulating Student Learning concentrated on support/ assistance, and the teacher setting appropriate expectations. While these general ideas were confirmed, the factor analysis completed on the MPOT, showed the student's ideas clustering in a similar, yet tailored way.

Through factor analysis three factors were revealed for the MPOT; the first measured Positive Relationships between the teacher and student, the second measured Cognitive Engagement, and the third measured Personal Control. The emergence of three factors is consistent with the current literature on teacher-student relationships (Davis, 2003; Skinner & Belmont, 1993; Wentzel, 2002). Findings from the present study provide additional support that positive teacher-student relationships are important with regard to elementary school students' perceptions of teacher effectiveness.

Between the ages of 8 and 14 (Grades 4-8) sophisticated understanding of how others think is achieved gradually. Students in this age range focus on psychological traits such as understanding and concern for others' feelings (Selman, 1981). These are essential when individuals are involved in a positive relationship. An educator can reap the benefits of the students' perceptions, and use it to better themselves professionally. These 3 scales not only confirm Feldman (1976), Toland and DeAyala (2005) and d'Apollonia & Abrami's (1997) conclusions on roles of effective instructors, but add to the research showing slight differences in how elementary school students perceive effective teachers, as opposed to high school or university students. It is evident that elementary school students focus more on factors encouraging the child's self-efficacy

and self-determination, as well as being encouraging and caring, whereas Feldman (1976), Toland and DeAyala (2005) and d'Apollonia & Abrami (1997) found that older students focused more on availability of their instructor, feedback and evaluation and showing respect for the students .

Criterion Validity.

Discriminant validity describes the degree to which an object or idea is not similar to (diverges from) other objects or ideas that it theoretically should not be similar to (Tabachnick & Fidell, 2007). This idea is relevant to analyzing differences between answers of students who differed in age and sex, and how well the student felt the teacher knows them. For this reason, a pair of analyses of variance was used.

It was hypothesized that there would indeed be sex differences based on the nature of the questions, (focusing more on the emotional aspects of a teacher helping the student) as girls are better able to express their emotions and interpret others' emotions (Strough & Berg, 2000). A significant difference between girls and boys on questions pertaining to Factor 1 was found, with girls having significantly higher scores than boys. Because Factor 1 deals with positive relationships, most developmentalists would agree that a sex difference is present, as the regions of the brain's temporal lobe that play a leading role in processing emotional expression develop more rapidly in girls than boys (McClure, 2000). Also, parents are more "feeling oriented" with daughters than sons and they are more likely to talk about emotions with daughters than with sons as well as emphasizing the importance of thinking about others' feelings and relationships (Strough & Berg, 2000).

Factor 2, Cognitive Engagement produced similar results, with males having significantly lower scores than females. This may be due to the fact young girls are more likely than young boys to comply with an adult's request, and are more likely to seek an adult's help (Maccoby, 1990). Being more apt to seek out an adult's assistance would reinforce the idea that the student's teacher would believe that the student was capable of completing a task, expect it from them, and would care if the student is not understanding the material of a lesson. Boys are just as likely to realize they may have a problem with understanding an idea in their schoolwork, but are not as likely to seek assistance from their teacher. Another possibility may be that girls are more perceptive, and see teachers as more cognitively engaged, because teachers actually are.

Interestingly, Factor 3, Personal Control produced no significant differences between the sexes. This may be due to the fact that in early adolescence, males and females do not differ in many aspects of cognition, cognitive processing, memory, personality and social behaviour (Strough & Berg, 2000). Making learning relevant, using different ways of giving information and acknowledging learning achievements seem to be viewed similarly by both sexes at this age.

Perceptions of how well students felt their teacher knew them were also expected to be different when answering the questions on the MPOT. It follows that if students feel that their teacher knows them well, they are more likely to answer the questions about their teacher more favourably, translating to higher MPOT scores. Birch and Ladd (1996) found that teacher-student interpersonal behaviour is seen as an important factor related to perceptions of satisfaction in the classroom by students. There was a significant higher difference between categories on questions pertaining to Positive Relationships with

students that answered 'very well' having significantly higher scores than those answering 'somewhat well'. As well as with Cognitive Engagement, which produced similar results, students answering 'very well' had significantly different scores than those answering 'somewhat well'. When it came to Personal Control significant differences were also found, with students answering 'very well' having significantly different scores than those answering 'somewhat well'. In a study by Birch and Ladd, (1996) the most frequently mentioned attribute of positive student perception of their teacher was their teachers' willingness to care about them and bond with them. Other frequently mentioned characteristics of effective teachers include the ability to build community and efforts to make learning interesting. King et al., (2008) addressed these characteristics by including MPOT items such as "often gets me interested in a topic", "relates information presented in class to my life", "accepts me for who I am, and "understands me as a person". It was shown that when elementary school students rate their teacher higher on these questions, that the overall perception of the teacher being effective was greater.

Developmentally, students across grades 4 to 8 differ, so it was thought that there would be a difference among the answers of students in varying grades. It was found that responses differed significantly across the five grades on Factors 1 and 2, but not for Factor 3. For Factor 1, Grade 6 differed significantly from Grade 4, and Grade 8, but not from Grades 5 and 7. In terms of Positive Relationships, the results come as no surprise based on research in current literature (McClure, 2000). Because ten, eleven or twelve year olds (Grades 5 through 7) may be making first efforts at independence this can change their relationships with teachers. Boys may move away from a close or

appreciative relationship with teachers and girls who have had a good relationship with their teachers may become a little emotionally distant with them (Selman, 1981). This may account for the differences in how students in certain grades may feel their teacher knows/cares about them. With Factor 2, Cognitive Engagement, Grade 6 students differed significantly from those in Grades 4 through 8. This may be due to Grade 6 students moving away from middle childhood, and becoming adolescents who bounce between childhood and adulthood, being irresponsible and responsible, testing authority and then depending on these authority figures. Eleven year olds may begin to start wanting to do things more independently, and they do need to stretch their wings a little bit (Harter & Monsour, 1992). Asserting this independence may play a factor in how the student believes their teacher believes in the student and how he/she can change or improve.

Based on this research study, its conclusions, and with the results of the analyses of variance, along with the test-retest reliability, internal consistency and the 3 factors produced, the Measures of Processes of Teaching is a valid and reliable measure for use in an elementary school setting to aid educators in achieving the goal of becoming an effective teacher.

Educational Implications

Because the MPOT is relatively short in duration, it is an ideal tool for teachers to use on their own, in their classrooms. The MPOT is not meant to be an evaluative tool, but a means for educators to use as part of their professional development to enhance themselves as teachers, and to better their relationships with students, bringing them closer to the idea of an 'expert'/ effective teacher. To be an effective teacher is a

continuous process that stretches from the teachers' pre-service experiences in the undergraduate years to the end of their professional career path. Teachers will need ongoing opportunities to develop their knowledge, understanding, skills and abilities to keep pace with the continuously increasing and changing national education agenda (Hamzah, Mohamad, & Ghorbani, 2008). Professional development for teachers should focus on significant variables that contribute directly or indirectly to students' thinking and perceptions of their teacher.

This thesis has several focuses and strengths that resonate well within the realm of education. One predominant area would be the use of inclusive classrooms. Using a sample that includes students from inclusive classrooms shows that the measure is indeed applicable for all children to be able to complete. Another strength would be the number of students sampled. Having a sample of 142 students is a significant sample or number when it comes to research. Comrey and Lee (1992) state that in the case for factor analysis about 140 cases is sufficient for a sample size.

Ethical implications in distributing the MPOT to teachers as researchers would be to ensure that the teachers are using the MPOT not as an evaluative measure, but as a mode of personal development. It would need to be reinforced that the questionnaires need to remain anonymous, and that the teacher would not be able to share the results with others. It would be up to the researcher to ensure validity and reliability of the MPOT in order to be used in a classroom setting.

In this research, the MPOT contributed directly and significantly to perceptions of effective teaching performance. To accelerate excellent teachers' teaching performance, development programs should stress methods that assist and help teachers reflect and

analyze their students thinking which contributes to increasing the teachers' expectations of excellence. Teachers who understand their expectations will not only help themselves perform better but also will improve students' performance (Putnam & Borko, 2000). With these results, teachers will be able to reflect on their own teaching and verbal and physical communication in the classroom (Fisher et. al. 1996).

Limitations of the investigation

Although the information regarding the reliability and validity of the MPOT is promising, there are some limitations associated with this study. A limitation to this study may be the two week period used to establish test-retest reliability. Although this two week period may be effective at reducing memory effects, it may also be long enough to allow for a significant change in a student's perception of a teacher, if an incident took place in the classroom during the two week interval between test and retest.

Another limitation to the study could be teacher presence. For some classrooms the teacher remained present while the students completed the MPOT. Students may have felt pressured to complete the questionnaire more favourably than if their teacher was not nearby.

Future directions and conclusions

As interest in professional development of teachers increases along with the incorporation of student's perceptions of teacher behaviours, methods of quantifying the information is necessary (Toland, & DeAyala, 2005). The current study is but one small contribution to this area of research. The findings of this study need to be replicated with different samples of students and teachers in a variety of geographical locations and in different socio-economic situations and conditions to enhance the reliability and validity

of the findings. Further, a more even distribution of grades is recommended. Another area worthy of further investigation is, as previously mentioned, having an even distribution of sexes of teachers, as researching the difference between students' perceptions of caring in male or female teachers may differ. This research could also be repeated with a different sample of students and teachers in other countries to observe the effect of environment and potential political variables on students' perceptions of their teachers' caring behaviours.

In conclusion, the present investigation has presented initial evidence for the reliability and validity of the obtained scale scores from the 17-item Measure of Processes of Teaching (MPOT). This study has extended research on the measurement of the quality of teacher-student interaction, and teacher effectiveness in the literature. There was a need to develop a brief measure focused on elementary school student's constructs of clarity of teaching, teacher support and teacher understanding and respect of and for them that yielded scores that were reliable and valid. It is concluded that the MPOT has more than fit this criteria.

It is hoped that the brief 17-item MPOT, developed and initially validated for use with children from Grade 4 through 8, will facilitate research on building supportive relationships between teachers and students. If the MPOT is shared widely and encouraged in elementary classrooms, it is also anticipated that this research can promote teachers enhancement of utilizing new professional development tools, in order to develop or improve their teacher effectiveness.

References

- Abrami, P., et al. (1996). Research on cooperative learning and achievement: Comments on Slavin. *Contemporary Educational Psychology, 21*, 70-79.
- Berliner, D. C. (2004) Describing the behavior and documenting the accomplishments of expert teachers. *Bulletin of Science, Technology & Society, 24*, 200-212.
- Birch, S. H., & Ladd, G. W. (1996). Interpersonal relationships in the school environment and children's early school adjustment: The role of teachers and peers. In J. Juvonen & K. Wentzel (Eds.), *Social Motivation: Understanding children's school adjustment* (pp. 199-223). New York: Cambridge University Press.
- Blanton, L. P., Sindelar, P. T., & Correa, V. I. (2006). Models and measures of beginning teacher quality. *The Journal of Special Education, 40*, 115-127.
- Cattell, R. B., (1988). The meaning and strategic use of factor analysis. In J.R. Nesselroade & R.b.b Cattell (Eds.), *Handbook of multivariate experimental psychology*. (2nd ed.). New York: Plenum Press.
- Chen, W., Burry-Stock, J. A., & Rovegno, I. (2000). Self-evaluation of expertise in teaching elementary physical education from constructivist perspectives. *Journal of Personnel Evaluation in Education, 14*, 25-45.
- Chi, M., Glaser, R., & Rees, E. (1982) Expertise in problem solving. In R. Sternberg (Ed.) *Advances in the psychology of human intelligence* (Vol. 1, pp. 7-75). Hillsdale, NJ: Erlbaum.
- Comrey, A. L., & Lee, H. B. (1992). *A first course in factor analysis* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- d'Apollonia, S., & Abrami, P. (1997). Navigating student ratings of instruction. *American*

Psychologist, 52, 1198-1208.

- Davis, H. A. (2003). Conceptualizing the role and influence of student-teacher relationships on children's social and cognitive development. *Educational Psychologist*, 38, 207-234.
- Doherty, R. W., Hilberg, R. S., Epaloose, G., & Tharp, R. G. (2002). Standards performance continuum: Development and validation of a measure of effective pedagogy. *The Journal of Educational Research*, 96, 78-89.
- Dominy, D., & Marshall, K. (1995). Psychometric properties of the communication portions of the daily living questionnaire for parents and the daily living questionnaire for teaching personnel, and the classroom behaviours questionnaire (Masters thesis, Faculty of Graduate Studies, UWO, July 1995).
- Dorner, D., & Scholkopf, J. (1991). Controlling complex systems; or as expertise as "grandmother's know-how". In K.A. Ericsson & J. Smith (Eds.), *Toward a general theory of expertise: Prospects and limits* (pp. 218-239). New York: Cambridge University Press.
- Eells, T., Lombart, K., Kendjelic, E., Turner, L., & Lucas, C. (2005) The quality of psychotherapy case formulations: A comparison of expert, experienced and novice cognitive-behavioral and psychodynamic therapists. *Journal of Consulting and Clinical Psychology*, 75(4), 579-589.
- Ericsson, K., & Lehmann, A. (1996) Expert and exceptional performance: Evidence of maximal adaptation to task constraints. *Annual Review of Psychology*, 47, 273-305.
- Feldman, K. (1976). The superior college teacher from the students' view. *Research in*

Higher Education, 5, 243-288.

- Fisher, D., Rickards, T., & Fraser, B. (1996). Assessing teacher-student interpersonal relationships in science classes. *Australian Science Teachers Journal*, 42, 28-33.
- Fraser, B. J., (1993). Classroom and school climate. In D. Gabel (Ed.), 1993 *Handbook of research on science teaching and learning* (159-208) New York, MacMillan.
- Fraser, B. J. (1997). Classroom environments. In J. Keeves (Ed.), *Educational research, methodology, and measurement: An international handbook* (896-900) Tarrytown, Elsevier Science Ltd.
- Goodyear, R. K. (1997) Psychological expertise and the role of individual differences: An exploration of issues. *Educational Psychology Review*, 9, 251-265.
- Haertel, G. D., Walberg, H. J., & Haertel, E. H. (1981). Sociopsychological environments and learning: A quantitative synthesis. *British Educational Research Journal*, 7, 27-36.
- Hair, J. F., Anderson, R. E., Tatham, R. L., and Black, W. C. (1992) *Multivariate data analysis* (3rd ed.). New York: Macmillan.
- Hamzah, M., Mohamad, H., & Ghorbani, M. (2008). Excellent teachers' thinking model: Implications for effective teaching. *Australian Journal of Teacher Education*, 33, 11-27.
- Harter, S., & Monsour, A. (1992). Developmental analysis of conflict caused by opposing attributes in the adolescent self-portrait. *Developmental Psychology*, 28, 251-260.
- Herzberg, P. (1983). *Principles of Statistics*. Malabar, FL: Krieger Publishing Company.
- Higgs, J., & Jones, M. (2000). Clinical reasoning in the health professions. In J. Higgs & M. Jones (Eds.), *Clinical reasoning in the health professions* (2nd ed., pp. 3-14).

Oxford: Butterworth Heinemann.

- King, G. (2009) A relational, goal oriented model of optimal service delivery to children and families. *Physical & Occupational Therapy in Pediatrics*, 29, 384-408.
- King, G., Bartlett, D. J., Currie, M., Gilpin, M., Baxter, D., Willoughby, C., et al. (2007). Measuring the expertise of pediatric rehabilitation therapists. *International Journal of Disability, Development and Education*, 54, 381-406.
- King, G., Currie, M., Bartlett, D., Strachan, D., Tucker, M., & Willoughby, C., et al. (2008). The development of expertise in paediatric rehabilitation therapists: The roles of motivation, openness to experience and types of caseload experience. *Australian Occupational Therapy Journal*, 55, 108-122.
- King, G., Rosenbaum, P., & King, S. (1997). Evaluating family-centred service using a measure of parents' perceptions. *Child: Care, Health and Development*, 23, 47-62.
- King, G., Servais, Specht, J., Bartlett, I., Gilpin, M., Petersen, P., & Stewart, S. (2008). *Measures of Processes of Teaching*. Unpublished questionnaire.
- Knox, V., & Menzies, S. (2005). Using the Measure of Processes of Care to assess parents' views of a paediatric therapy service. *British Journal of Occupational Therapy*, 68, 110-116.
- McClure, E.B. (2000). A meta-analytic review of sex differences in facial expression processing and their development in infants, children and adolescents. *Psychological Bulletin*, 126, 424-453.
- McDowell, I. (2006). *Measuring health: A guide to rating scales and questionnaires* (3rd ed.). New York, NY: Oxford University Press.

- McDowell, I., & Newell, C. (1996). *Measuring health: A guide to rating scales and questionnaires*. (2nd ed.). New York: Oxford University Press.
- Maccoby, E. E. (1990). Gender and relationships: A developmental account. *American Psychologist*, 45, 513-520.
- Marsh, H. (1987). Students' evaluations of university teaching: Research findings, methodological issues and directions for future research. *International Journal of Educational Research*, 11, 253-388.
- Marsh, H., Fleiner, H., & Thomas, C. (1975). Validity and usefulness of student evaluations of instructional quality. *Journal of Educational Psychology*, 67, 833-839.
- Martin, J., Slemon, A., Hiebert, B., Hallberg, E., & Cummings, A. (1989). Conceptualizations of novice and experienced counselors. *Journal of Counseling Psychology*, 36(4), 395-400.
- Messick S. Validity of Psychological Assessment: Validation of Inferences from Persons' Responses and Performances as Scientific Inquiry into Score Meaning. RR-94-45, 1-33. 1994. Princeton, NJ, U.S. Educational Testing Service, Educational Testing Service. Ref Type: Report.
- Mithaug, D., Mithaug, D., Agran, M., Martin, J., & Wehmeyer, M. (2003). How Adjustment affects learning. In D.E. Mithaug, D.K. Mithaug, M. Agran, J. Martin & M. Wehmeyer (Eds.), *Self-determined learning theory: Construction, verification, and evaluation* (pp. 37-58). Mahwah, NJ: Erlbaum.
- Norman, G.R., & Streiner, D.L. (1986). *PDQ statistics*. Toronto: B.C. Decker.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York, NY:

McGraw-Hill.

- Nunnally, J. C., & Wilson, W. H. (1975). Method and theory for developing measures in evaluation research. In E.L. Struening & M. Guttentag (Eds.), *Handbook of evaluation research Vol. 1* (pp. 227-288). Beverly Hills: Sage.
- Palmer, D. J., Stough, L. M., Burdenski, T. K., & Gonzales, M. (2005). Identifying teacher expertise: An examination of researchers' decision making. *Educational Psychologist, 40*, 13-25.
- Pressley, M., Dolezal, S.E., Raphael, L., Mohan, L., Roehrig, A.D., & Bogner, K. (2003). *Motivating primary grade students*. New York. Guilford
- Pressley, M., Mohan, L., Raphael, L., & Fingeret, L. (2007) How does Bennett Woods elementary school produce such high reading and writing achievement? *Journal of Educational Psychology, 99*, 221-240.
- Portney, L. G., & Watkins, M. P. (2000). *Foundations of clinical research: Applications to practice* (2nd ed.). New Jersey, USA: Prentice-Hall Inc.
- Putnam, R.T. & Borko, H. (2000). What do new views of knowledge and thinking have to say about research on teacher learning?. *Educational Researcher, 29*, 4-15.
- Rogers, J., & Holm, B. (1997). Diagnostic reasoning: The process of problem identification. In C.H. Christiansen & C.M. Baum (eds.), *Occupational therapy: Enabling function and well being* (pp. 137-156). Thorofare, NJ: Slack.
- Schön, D. (1983). *The reflective practitioner. How professionals think in action*. New York: Basic Books.
- Selman, R. L. (1981). The child as a friendship philosopher: A case study in the growth

- of interpersonal understanding. In S. R. Asher & J. M. Gottman (Eds.), *The development of children's friendships*. Cambridge, England: Cambridge University Press.
- Shulman, L. (1987). Knowledge and teaching: Foundations for the new reform. *Harvard Educational Review*, 57, 1-22.
- Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. *Journal of Educational Psychology*, 85, 571-581.
- Skovholt, T., Jennings, L., & Mullenbach, M. (2004). Portrait of the master therapist: Developmental model of the highly functioning self. In T. Skovholt & L. Jennings (eds.), *Master therapists: Exploring expertise in therapy and counseling* (pp. 125-146). Boston Allyn & Bacon.
- Spooren, P., Mortelmans, D., & Denekens, J. (2007). A prototype view of expert teaching. *Assessment & Evaluation in Higher Education*, 32, 667-679.
- Sternberg, R. J., & Horvath, J. A. (1995). Student evaluation of teaching quality in higher education: development of an instrument based on 10 likert-scales. *Educational Researcher*, 24, 9-17.
- Strough, J., & Berg, C. A. (2000). Goals as a mediator of gender differences in high affiliation dyadic conversations. *Developmental Psychology*, 36, 117-125.
- Tabachnick, B.G., & Fidell, L.S. (2007). *Using multivariate statistics* (5th edn). New York: HarperCollins.
- Thorndike, R. L., & Thorndike, R. M. (1997). Reliability. In J. Keeves (Ed.), *Educational*

research, methodology, and measurement: An international handbook (775-790)

Tarrytown, Elsevier Science Ltd.

Toland, M., & DeAyala, R. (2005). A multilevel factor analysis of students' evaluations of teaching. *Educational and Psychological Measurement, 65*, 272-296.

Watson, J. (2009). *Assessing and measuring caring in nursing and health sciences*. New York, NY: Springer Publishing Company.

Wentzel, K. R. (2002). Are effective teachers like good parents? Teaching styles and student adjustment in early adolescence. *Child Development, 73*, 287-301.

Wubbels, T., & Levy, J. (Eds.). (1993). *Do you know what you look like? Interpersonal relationships in education*. London, England: Falmer Press.

Zeller, R. A. (1997). Validity. In J. Keeves (Ed.), *Educational research, methodology, and measurement: An international handbook (822-829)* Tarrytown, Elsevier Science Ltd.

APPENDIX A

MEASURE OF PROCESSES OF TEACHING (MPOT)

Measure of Processes of Teaching (MPOT)

IMPORTANT INSTRUCTIONS:

We want to know how your teacher teaches and how you learn from your teacher.

Please tell us what you think about your teacher.

There are no right or wrong answers. Your teacher will not see this page.

Think about you and your teacher when you read each sentence. Then circle the number that best describes how you see your teacher (7 means that the statement is very much like your teacher and 1 means the statement is not at all like your teacher).

Questions About You

1. What is your age?

_____ years

2. What grade are you in?

3. Are you a boy / girl?

Boy

Girl

Questions About Your Teacher

1. Is your teacher a man / woman?

Man

Woman

2. How long has he or she been your teacher?

_____ years

3. How well does your teacher know you?

Very well

Somewhat well

Not very well

MY TEACHER...		7 Exactly Like My Teacher	6 Very Much Like My Teacher	5 Quite a Bit Like My Teacher	4 A Fair Bit Like My Teacher	3 Some- what Like My Teacher	2 A Little Like My Teacher	1 Not at All Like My Teacher
1	cares about me	7	6	5	4	3	2	1
2	treats me fairly	7	6	5	4	3	2	1
3	understands me as a person	7	6	5	4	3	2	1
4	accepts me for who I am	7	6	5	4	3	2	1
5	respects my opinions	7	6	5	4	3	2	1
6	listens to me when I have something to say	7	6	5	4	3	2	1
7	explains things to me clearly	7	6	5	4	3	2	1
8	helps me understand the material	7	6	5	4	3	2	1
9	uses different ways to help me learn	7	6	5	4	3	2	1
10	gives me choices	7	6	5	4	3	2	1
11	often gets me interested in a topic	7	6	5	4	3	2	1
12	relates information presented in class to my life	7	6	5	4	3	2	1
13	motivates me to learn	7	6	5	4	3	2	1
14	encourages me to do my best	7	6	5	4	3	2	1
15	gives me helpful comments about my work	7	6	5	4	3	2	1
16	acknowledges my learning achievements	7	6	5	4	3	2	1
17	gives me a marking outline (a rubric) before I start assignments so that I know what is expected to get a good mark	7	6	5	4	3	2	1
18	helps me with my work	7	6	5	4	3	2	1

MY TEACHER...		7 Exactly Like My Teacher	6 Very Much Like My Teacher	5 Quite a Bit Like My Teacher	4 A Fair Bit Like My Teacher	3 Somew hat Like My Teacher	2 A Little Like My Teacher	1 Not at All Like My Teacher
19	understands my pace for learning the material	7	6	5	4	3	2	1
20	cares if I am not doing as well as I should	7	6	5	4	3	2	1
21	expects me to do my best work	7	6	5	4	3	2	1
22	encourages me to try my best	7	6	5	4	3	2	1
23	believes that I can learn	7	6	5	4	3	2	1
24	gives me feedback on how well I am learning	7	6	5	4	3	2	1

APPENDIX B
ETHICS APPROVAL



**THE UNIVERSITY OF WESTERN ONTARIO
FACULTY OF EDUCATION**

USE OF HUMAN SUBJECTS - ETHICS APPROVAL NOTICE

Review Number: 0907-2

Applicant: Jacqueline Specht

Supervisor:

Title: *Psychometric Properties of the Measures of Processes of Teaching (MPOT)*

Expiry Date: March 31, 2010

Type: Faculty

Ethics Approval Date: August 25, 2009

Revision #:

Documents Reviewed &

Approved: UWO Protocol, Letters of Information & Consent

This is to notify you that the Faculty of Education Sub-Research Ethics Board (REB), which operates under the authority of The University of Western Ontario Research Ethics Board for Non-Medical Research Involving Human Subjects, according to the Tri-Council Policy Statement and the applicable laws and regulations of Ontario has granted approval to the above named research study on the date noted above. The approval shall remain valid until the expiry date noted above assuming timely and acceptable responses to the REB's periodic requests for surveillance and monitoring information.

No deviations from, or changes to, the research project as described in this protocol may be initiated without prior written approval, except for minor administrative aspects. Investigators must promptly report to the Chair of the Faculty Sub-REB any adverse or unexpected experiences or events that are both serious and unexpected, and any new information which may adversely affect the safety of the subjects or the conduct of the study. In the event that any changes require a change in the information and consent documentation, newly revised documents must be submitted to the Sub-REB for approval.

Dr. Jason Brown (Chair)

2009-2010 Faculty of Education Sub-Research Ethics Board

Dr. Jason Brown	Faculty (Chair)
Dr. Elizabeth Nowicki	Faculty
Dr. Jacqueline Specht	Faculty
Dr. Farahnaz Faez	Faculty
Dr. Wayne Martino	Faculty
Dr. Immaculate Namukasa	Faculty
Dr. Robert Macmillan	Assoc Dean, Graduate Programs & Research (<i>ex officio</i>)
Dr. Jerry Paquette	UWO Non-Medical Research Ethics Board (<i>ex officio</i>)

The Faculty of Education	Karen Kueneman, Research Officer
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London, ON N6G 1G7	kueneman@uwo.ca
	519-661-2111, ext.88561 FAX 519-661-3029

APPENDIX C

LETTER OF INFORMATION

Psychometric Properties of the Measure of Processes of Teaching (MPOT)

STUDENT LETTER OF INFORMATION

Introduction

My name is Jacqueline Specht and I am an associate professor at the Faculty of Education at The University of Western Ontario. I am currently conducting research into perceptions of teaching and would like to invite you to participate in this study.

Purpose of the study

The aim of this study is to generate new knowledge about elementary student's perceptions of their teachers, which will add to our understanding of the professional development of teachers.

If you agree to participate

If you agree to participate in this study you will be asked to fill out a survey on your perceptions of your teacher, at 2 different dates within a 1-month span. Each time, you will spend about 30 minutes of your classroom time to fill out the surveys. Your teacher has agreed to participate in this study and knows that you will be completing the questionnaire about him/her with other students in your class. Your teacher will not be in the room while you fill in the questionnaire.

Confidentiality

The information collected will be used for research purposes only, and neither your name nor information which could identify you, your teacher, or your school will be used in any publication or presentation of the study results. All information collected for the study will be kept confidential. Your teacher will not be told the results of your perceptions or the perceptions of any of your classmates. All information collected from participants will be combined, thus, your name will not appear in any report or presentation resulting from this study. This data will be kept for a period of 2 years and will be securely stored in a locked office at all times.

Risks & Benefits

There are no known risks to participating in this study.

In appreciation for your assistance with this study, your name will be entered in a draw with other students to win one of five \$25 gift certificates to White Oaks Mall.

Voluntary Participation

Participation in this study is voluntary. You may refuse to participate, refuse to answer any questions or withdraw from the study at any time. This will in no way affect you at school.

Questions

If you have any questions about the conduct of this study or your rights as a research participant you may contact the Manager, Office of Research Ethics, The University of Western Ontario at 519-661-3036 or ethics@uwo.ca. If you have any questions about this study, please me at xxxxxx@uwo.ca or (xxx) xxx-xxxx extension xxxxx.

This letter is yours to keep for future reference.

Table 1

Factor loadings and communalities based on a principal components analysis with varimax rotation for 24 items from the Measure of Processes of Teaching (MPOT)

	Factor 1	Factor 2	Factor 3
Question 3 Understands me as a person	.723		
Question 2 Treats me fairly	.714	.333	
Question 14 Encourages me to do my best	.683	.450	
Question 7 Explains things to me clearly	.667	.343	.348
Question 4 Accepts me for who I am	.627	.414	
Question 1 Cares about me	.621		.352
Question 6 Listens to me when I have something to say	.610		.387
Question 8 Helps me understand the material	.600		
Question 13 Motivates me to learn	.587	.416	
Question 23 Believes that I can learn		.803	
Question 20 Cares if I am not doing as well as I should	.324	.691	
Question 22 Encourages me to try my best	.456	.688	
Question 21 Expects me to do my best work		.638	
Question 11 Often gets me interested in a topic	.322	.523	.500
Question 19 Understands my pace for learning the material	.366	.493	.480
Question 18 Helps me with my work	.368	.447	.397
Question 24 Gives me feedback on how well I am learning	.340	.348	.703
Question 12 Relates information presented in class to my life	.364		.658
Question 10 Gives me choices	.368		.640
Question 17 Gives me a marking outline		.540	.618
Question 9 Uses different ways to help me learn	.418		.589
Question 15 Gives me helpful comments about my work	.329	.452	.514
Question 16 Acknowledges my learning achievements		.494	.512
Question 5 Respects my opinions	.481	.334	.503

Note. Factor loadings < .32 are suppressed; N = 142

Table 2

Factor loadings and communalities based on a principle components analysis with varimax rotation for 17 items from the Measure of Processes of Teaching (MPOT)

	Positive Relationship	Cognitive Engagement	Personal Control
Question 3 Understands me as a person	.733		
Question 2 Treats me fairly	.713		
Question 14 Encourages me to do my best	.747	.356	
Question 7 Explains things to me clearly	.755		.323
Question 4 Accepts me for who I am	.650	.368	
Question 1 Cares about me	.618		.379
Question 8 Helps me understand the material	.643		.346
Question 13 Motivates me to learn	.642	.325	
Question 23 Believes that I can learn		.818	
Question 20 Cares if I am not doing as well as I should	.440	.580	
Question 22 Encourages me to try my best	.517	.673	
Question 21 Expects me to do my best work		.732	
Question 24 Gives me feedback on how well I am learning	.353	.339	.730
Question 12 Relates information presented in class to my life	.323		.690
Question 10 Gives me choices	.367		.651
Question 17 Gives me a marking outline		.543	.620
Question 9 Uses different ways to help me learn	.485		.623

Note. Factor loadings < .32 are suppressed; Bold factor loadings indicate inclusion on scale

Table 3
Means and Standard Deviation by sex, Factors 1, 2 & 3

		Mean	Std. Deviation
Factor 1	Male	45.71	9.85
	Female	48.58	6.36
Factor 2	Male	24.00	5.27
	Female	25.79	3.56
Factor 3	Male	25.75	7.68
	Female	27.22	6.04

Note. N = 142

Table 4
Means and Standard Deviations by Student perception of how well their teacher knows them, Factors 1, 2 & 3

		Mean	Std. Deviation
Factor 1	Very well	50.41	5.71
	Somewhat well	44.82	8.53
Factor 2	Very well	26.23	2.84
	Somewhat well	23.90	5.42
Factor 3	Very well	28.57	6.14
	Somewhat well	25.12	6.68

Note. N = 142

Table 5 – Item Means for Each Scale

Positive Relationships

	Mean	Std. Deviation
Question 3 understands me as a person	5.79	1.35
Question 2 treats me fairly	5.79	1.27
Question 14 encourages me to do my best	6.37	1.22
Question 7 explains things to me clearly	5.68	1.47
Question 4 accepts me for who I am	6.31	1.02
Question 1 cares about me	5.77	1.23
Question 8 helps me understand the material	5.89	1.32
Question 13 motivates me to learn	5.60	1.66

Note. N = 142

Cognitive Engagement

	Mean	Std. Deviation
Question 23 believes that I can learn	6.25	1.43
Question 20 cares if I am not doing as well as I should	5.75	1.72
Question 22 encourages me to try my best	6.29	1.34
Question 21 expects me to do my best work	6.63	0.99

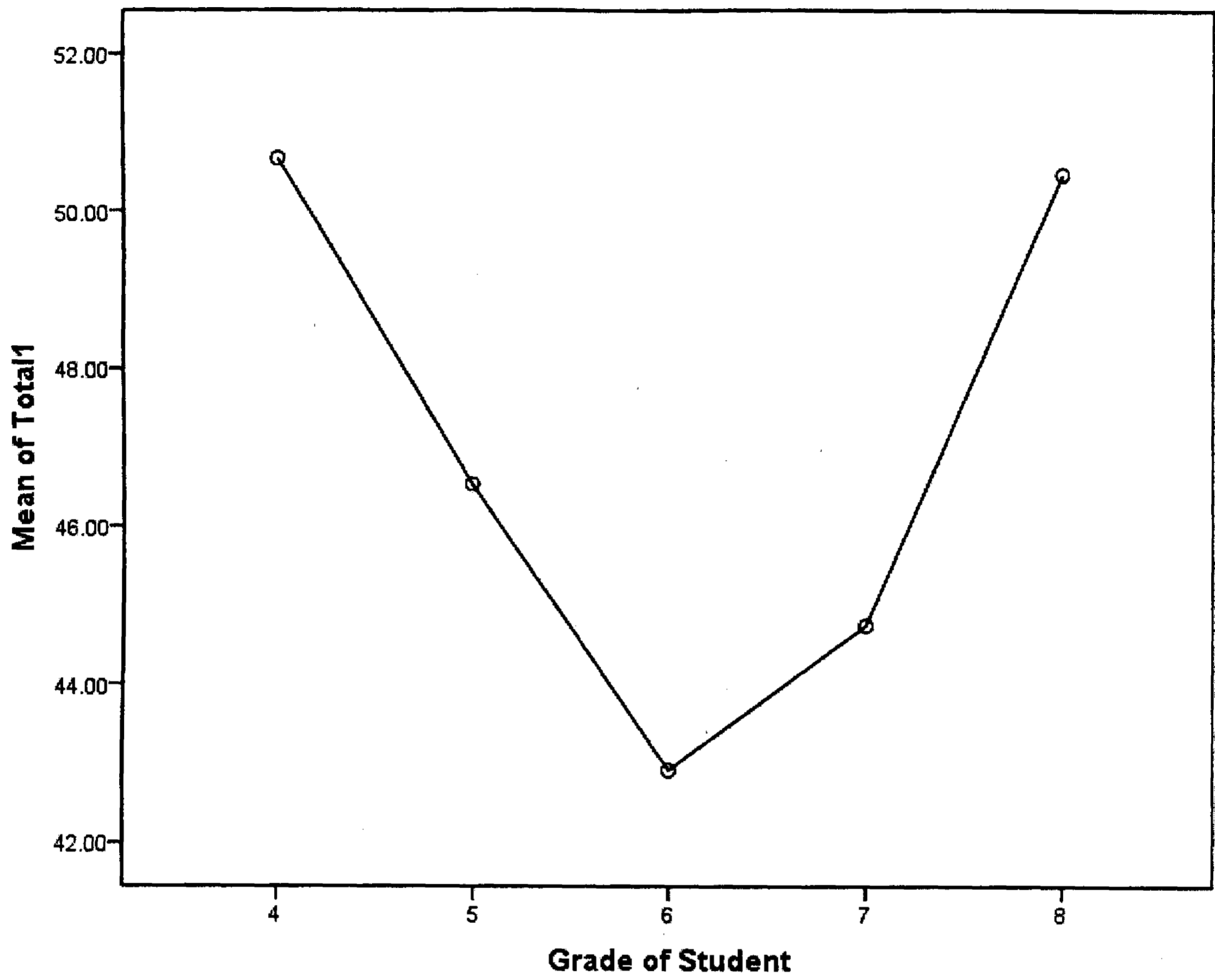
Note. N = 142

Personal Control

	Mean	Std. Deviation
Question 24 gives me feedback on how well I am learning	5.20	1.93
Question 12 relates information presented in class to my life	4.81	1.80
Question 10 gives me choices	5.35	1.50
Question 17 gives me a marking outline	5.55	1.94
Question 9 uses different ways to help me learn	5.60	1.63

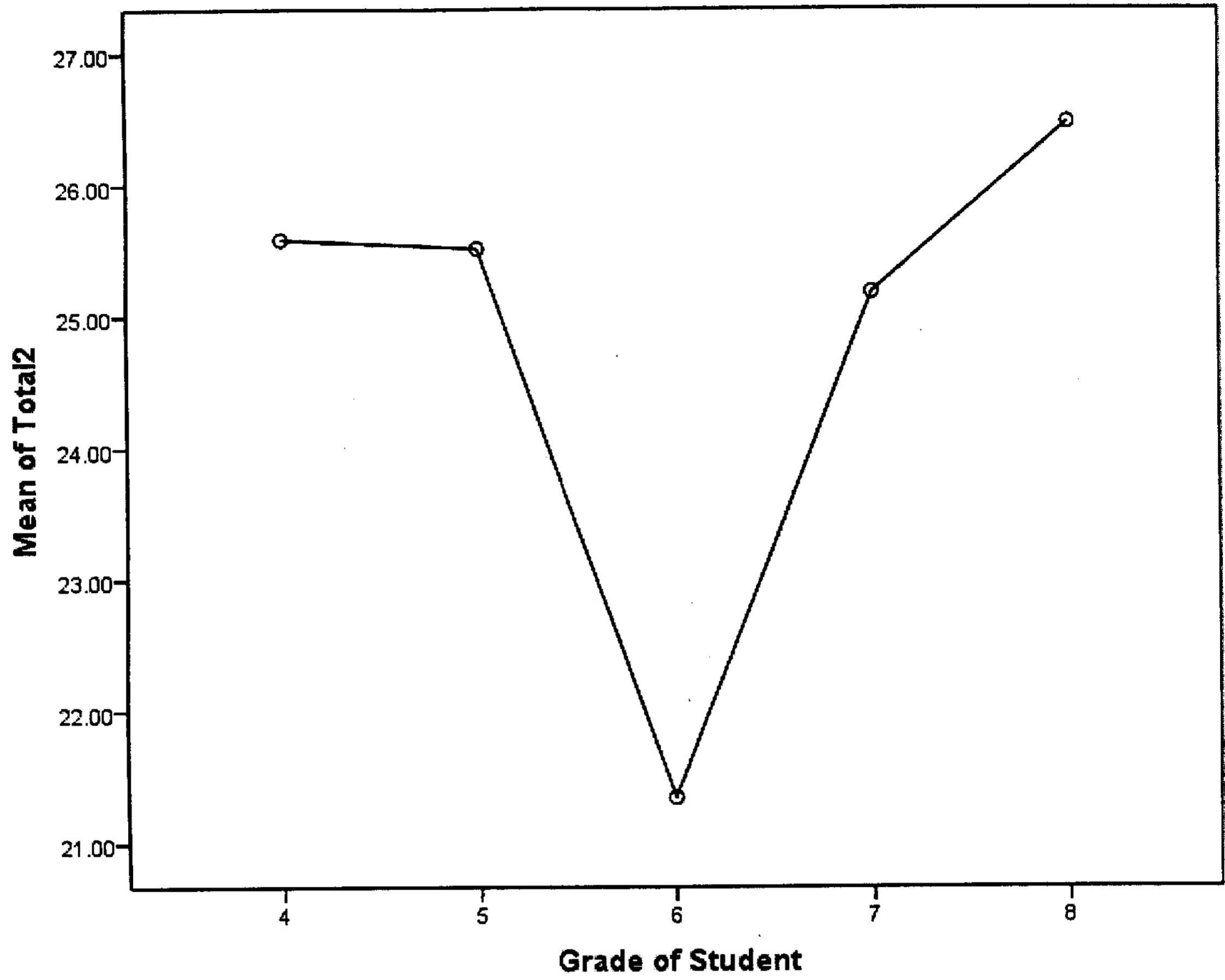
Note. N = 142

Figure 1. Plot of Scale 1 Mean Scores by Grade



Note. N = 142

Figure 2. Plot of Scale 2 Mean Scores by Grade



Note. N = 142