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Dear IEJEE Readers,

We are approaching a new fall with a comprehensive number of International Electronic Journal of Elementary Education (IEJEE).

Researchers *Demir, Kilinc* and *Dogan* are addressing the development of efficient study skills among 7th graders and the impact of curriculum on these skills.

Dundar and *Akcayir* of Kirikkale University, Turkey, based on an experimental study with 20 5th graders discuss the effect of text reading with tablet PCs and printed books.

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Luongo addresses the elementary school teachers' awareness of gender inequity in student computer usage in the US context.

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Ryan and *Gottfried* of Nipissing University, Canada, stress the importance of positive attitudes among the staff and the role of supervisors for a successful inclusion.

As the readers will realize, also this number of IEJEE takes up different important topics related to the education of the elementary students. I want to express my gratitude to all of the contributors, and to Dr. Turan Temur and Dr. Gokhan OZSOY for the demanding active editorialship that they have accomplished.

Sincerely,

Dr. Kamil Özerk, Editor-In-Chief
Professor of Education
University of Oslo

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The Effect of Curriculum for Developing Efficient Studying Skills on Academic Achievements and Studying Skills of Learners

Semra DEMİR*
Erciyes University, Turkey

Mehmet KILINC
Ministry of National Education, Turkey

Ali DOGAN
Ministry of National Education, Turkey

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Abstract

Purpose of this study is to examine the effect of "Development of Efficient Studying Skills Curriculum" on academic achievements and studying skills of 7th grade primary school students. In this study, pre-test-post-test from experiment models and semi-experimental model with control group were preferred. The reason for the preference is our wish to make a comparison between the group on which curriculum was implemented (experiment group), and the group on which curriculum was not implemented (control group) in terms of academic achievement, and acquiring efficient studying skills. Study population of this research covers 7th grade students from Refika Küçükçalık Primary School in Kocasinan district of Kayseri which is located in the middle of Turkey during 2011-2012 academic year (8 units, 320 students). Sample of the study was determined according to purposive sampling which is one of non-probability sampling types. Obtained data were analysed employing Covariance Analysis (ANCOVA). As a result, this research indicated that students can acquire efficient studying skills by means of Curriculum for Developing Efficient Studying Skills and they increase their academic achievements thanks to these studying habits. In this sense, if quality of education is desired to be increased, students with high level of academic achievements are intended and growing youth is expected to compete with the young population of other states with the effect of globalization, it is necessary to make students acquire efficient studying skills.

Keywords: Study Skills, Curriculum Development, Academic Achievements

* Semra DEMIR, , Erciyes University, Faculty of Education, Department of Educational Sciences, 38030 Kayseri / Turkey. e-mail: sdemir@erciyes.edu.tr &. Phone: +90 3522076600 / 37267 Fax: +90 352 437 88 34 GSM: 05336300878 E-Mail: sdemir@erciys.edu.tr

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Introduction

Learning takes place through experiences influencing psychological functions which lead to differences in behaviours. There are five elements in learning which are learner, learning, learnt, teacher, and learning environment. Taking these five elements in terms of influencing learning shows that last two elements do not affect learning directly but they have an indirect effect since they influence other elements. Thus, elements influencing learning can be approached in three different groups which are factors regarding the learner, factors regarding the learning materiall, and factors regarding the learning method (Bacanlı, 2005). These define the quantity and quality of learning by interacting with each other. While factors regarding the learner can be compiled as level of readiness for learning, age, intelligence, motivation level, interests and skills, characteristics, cognitive styles, and learning styles; perceptual distinguishability, semantic connotation, and conceptual grouping are related to learning material. On the other hand, structure of the subject to be learnt, the duration of time allocated for learning, feedback, and active participation are the factors associated with learning method (Senemoğlu, 2005).

In the past, people used to think that efficient learning depends mainly on teacher's teaching methods. However, today it is a commonly accepted fact that permanent and significant learning can be achieved only through learner efforts and contributions (Benson, 2001). From this point of view, learners can catch up with the intended achievement standards only by perceiving the given information accurately, analysing, and internalizing them. This process is briefly called studying (Bacanlı, 2005).

Studying behaviours are skills acquired during school years and they are difficult to change in the later periods of life. The most important factor influencing learner's achievements possesses the skills necessary for efficient studying (Küçükahmet, 2002). Endowing learners with efficient studying skills means both making them study deliberatively and understand their courses and aiding them to succeed in their exams. Learners studying properly value their skills and abilities in the best way. Learners without efficient studying skills have low level of achievement both in schools and professional lives since they cannot get the reward in return to the effort and time spent for learning (Yılmaz, 1987; Teker, 2002). Learners without efficient studying skills or learners with wrong studying skills are considered as one of the most basic reasons for failure in schools (Türkcan & Öcal, 2003). Yeşilyaprak (2000) and Türkoğlu et al., (1996) expressed that many students cannot succeed though they spend loads of time for studying. The motive behind this fact was suggested as not having the efficient studying skills. In addition, it was emphasized that even students who can be considered as successful do not possess adequate level of efficient studying skills. Students who cannot improve efficient studying and learning skills can be incapable of motivating themselves for learning, planning their learning processes and evaluating them as the grade goes up. This situation negatively influences their school achievements and therefore their life after school (Yıldırım, Doğanay & Türkoğlu, 2000).

Studying skills are influenced by learner motivation and their full and accurate use of time. Besides, learners' wish to study or not, difficulties in studying conditions, resistance against frustration and showing intimidation when faced with failure are factors influencing learning as well (Fidan, 1996).

Having unsuccessful learners at the end of education process leads to considerable amount of waste in investments made for education as well as supporting the worry about not being able to raise human force that society demands. It is known that learner failures are not limited with educational life but have much more wide effect. Currently, it is accepted that student failures is a problem growing each day. It is expressed that one of the biggest

underlying reasons for student failures is inadequacy of studying skills and attitudes (Küçükahmet, 2002).

There are many various definitions for studying skills in literature; however, studying skills are generally defined as "*using specific methods efficiently to learn something*" (Thomas, 1993; Uluğ, 2000; Yıldırım, Doğanay & Türkoğlu, 2000).

Studying skills are generally examined under the titles of planned studying, organizing study environment, efficient reading, listening lecture, note-taking, efficient writing expression, and doing homework (Dodge, 1994; Smith, 2000; Thomas, 1993; Uluğ, 2000; Yeşilyaprak, 2000; Yıldırım, Doğanay & Türkoğlu, 2000). Although these skills are independently important, they are not independent from each other. Strategies in relation to these skills are supportive of each other and high level of success can only be achieved by using all of them responsively together. (Crow, 1968; Gettinger & Seibert, 2002; Uluğ, 2000; Yıldırım, Doğanay & Türkoğlu, 2000).

Of studying skills, planned studying means having a purpose and this prevents students from disarrangement (Demir, 2011). Setting the period for studying is characterized by paying attention to studying courses at times close to the day and time of course lectures, making daily, weekly or monthly plans, providing flexibility to shift studying periods in case of sudden obstacles, defining durations in accordance with the course characteristics and knowing for certain what to study beforehand.

The concept of studying environment covers the environment both in and outside of school where learners continue their activities regarding the school. Preparing for studying can be expressed as organizing the place in such a way that it facilitates studying in terms of environment and the adopting the atmosphere suitable to read both physically and psychologically in terms of person (Baltaş, 1998).

Skills for reading and making sense of what you read, which have a place in educational process, are two of the most important elements contributing meaning to people's lives. Reading "broadens and deepens one's horizon by teaching new words, gaining new comprehensions, creating dreams and improving creativity" (Akyol, 2006, p. 29; Binbaşıoğlu, 1995). This process is influenced by past experiences of the reader, ability to use language, skill for making meaning of unknown words, and purpose of reading (Yüksel, 1997).

Efficient listening is not only hearing what is being said. It is an active process intended for spending effort to consider what is said as important, comprehend, and evaluate (Türkoğlu, Doğanay & Yıldırım, 1996). The concept of understanding is mainly related to listening skill. Listening skill, which is one of the basics in the development of native language skills, means "understanding, interpreting, evaluating, and organizing the suggested thoughts in the speech as well as detecting the relations between them and assorting the ones significant enough to store in the mind" (Taşer, 1996, p. 214). 42% of human communication covers listening and students listen both each other and their teacher in school for about 2, 5-4 hours. These results indicate that there is a strict relationship between learning in school and listening (Göğüş, 1978, p. 227). Yalçın, (2002, p. 45) claims that learners should be given a systematic listening education starting from the level they start to understand their teacher.

Note-taking is the process of writing the summary of information regarding a subject on a proper place to be used in the future. Note-taking and benefiting from the taken notes have a distinct and special importance from other learning materials in terms of efficient learning. This enables learners to think actively about the lectured subject and convey the information s/he internalized in an appropriate form on the paper.

From this aspect, note-taking increases learner concentration for listening the course. Similarly, since the information is processed and interpreted while reading, note-taking increases the efficiency of individual study. Thus, note-taking is of great importance in terms of both lecture and individual study. Notes taken during the courses aid students in determining what was important in the lecture (Ertuğrul, 2004, pp. 116-117).

Santangelo et al. (2007) stated that writing is extremely powerful means for communication since it creates a bound between times and distances, collects, and protects information, provides information about newly organized or spreading subjects, and creates a flexible environment for expressing yourself in terms of art, spirit and politics. Emphasizing that writing is a skill inseparable with communication and handled in educational activities, Temur (2011) denoted that past experiences are one of the elements influencing the efficiency of writing process. Temur (2011) said that some of the primary school beginners acquire important skills regarding reading and writing (vocal awareness, writing awareness) while some of them cannot.

Active participation in lectures is possible only through active learning. Active learning is a process in which learner bears the responsibility of learning process, learner is granted with the opportunity to make decisions and self-arrangements in relation to various aspects of learning process and learner is forced to use his/her mental abilities with various educational tasks. Theoretical background of active learning is based on constructivism.

Homework is one of the teaching methods outside of the school. It is also one of the most efficient instruments in giving importance, and meaning for old learning experiences, and acquiring new learning experiences (Tan & Erdoğan, 2004). Salend and Schliff (1998, p.398) consider homeworks as one of the methods for teaching and skill development. They explain the reasons for giving homework as follows; facilitating learning by making applications, individualizing learning for both slow learners and advanced learners, completing the subjects which are left unfinished in schools outside of school time, making learners acquire independent studying habits, and delivering what was taught in class to parents.

The fact that there is a difference between achievement levels of learners who acquired necessary methods, and habits for an efficient study, and learners who either possess none or limited amount of those habits was supported by researches. Researches regarding this topic revealed that students lack in terms of studying skills (Bay, Tuğluk & Gençdoğan, 2005; Kesiktaş, 2006; Koşar, 2004; Küçükahmet, 1987; Uluğ, 1981; Yıldırım et al., 2000) and indicated that a studying skills-aware education increases academic achievement, and self-confidence (Gall et al, 1990). Additionally, knowing these skills and using them in this process make important contributions to shortening the period for learning, saving the information, and developing skills for using (Gall et al, 1990). Besides, researches proved that there is a positive relationship between learner studying skills and academic achievements (Eliot, Godshall, Shrout & Withy; 1990; Bay, Tuğluk, Gençdoğan, 2005). Benjamin (1991) searched studying strategies of successful students to detect whether they are different from failed students in terms of quality in processing their knowledge. Findings indicated that successful students are more active, purposeful and flexible in using their strategies and more satisfied with their academic performances (eg., Tümkaya & Bal, 2006).

To Gall (1990), today many educators accept that "teaching learning" and therefore "developing studying skills" are as much important as teaching traditional courses (such as Mathematics and Turkish). For instance; studying skills has become one of the courses either for primary or secondary school level in many states of USA. Or studying skills are being taught to learners in the form of seminars. As for higher education, studying skills has started to be given as a course in undergraduate programmes since 1920s. These courses became

widespread since 1960s in many universities and some of the universities included it as a compulsory course. Also, private sector put too much stress on studying skills and studying skills seminars by private consultancy institutions regarding this sector are becoming widespread (Türkoğlu, Doğanay & Yıldırım 1996, p. 2-3).

Studying skills, which is given as a course in different grades in various states, is not a course covered in Turkish curriculum yet. There is also limited number of research made on this matter (Bay et al, 2005; Koşar, 2004). This indicates the lack of an important database regarding this matter in Turkey and the importance of this paper. In addition, it expected from the findings of this study to shed a light upon the authorities of ministries, school managers, teachers and parents.

Purpose of this study is to examine the effect of "Development of Efficient Studying Skills Curriculum" on academic achievements and studying skills of 7th grade primary school students. Questions below were tried to be answered to achieve this purpose:

1- Is there a significant difference between Post-Test Scores of students from experiment and control groups which they got from the entire Academic Achievement Test?

2- Is there a significant difference between Post-Test Scores of students from experiment and control groups which they got from the entire Efficient Studying Skills Habit Inventory?

Method

Research Model

In this study, pre-test-post-test from experiment models and semi-experimental model with control group were preferred. The reason for the preference is our wish to make a comparison between the group on which curriculum was implemented (experiment group), and the group on which curriculum was not implemented (control group) in terms of academic achievement, and acquiring efficient studying skills. This experimental pattern enables making such comparisons (Karasar, 2006, p. 110).Two of the present groups are appointed randomly to operation groups in semi-experimental pattern without random appointment (Fraenkel & Wallen, 2000, p. 283). In this way, examinees are similarly matched with each other as much as possible. The fact that central education is being applied in Turkey, where research took place, and classes are formed by school managers played a role in making this preference. That is because in Turkey, it is not possible for a researcher to form his/her own classes and use random appointment while making this process with specific number of students in classes for it is against the education system in Turkey. Therefore, of these two classes which were formed by school management at the same grade, one was selected as experiment and the other was selected as control group.

First hypothesis of the research is "There is a significant difference between Post-Test Scores of students from experiment and control groups which they got from the entire Academic Achievement Test", and the second hypothesis is "There is a significant difference between Post-Test Scores of students from experiment and control groups which they got from the entire Efficient Studying Skills Habit Inventory".

Population and Sample

There are two populations emphasized in scientific researches. One of these is general population which covers whole units wanted to be generalized with a large scope. Study population is the one which is available. The population about which the researcher will make comment is the study population. Practically, researchers are made with study

population. Thus, it is inevitable to generalize the results to this population (Karasar, 2006). Study population of this research covers 7th grade students from Refika Küçükçalık Primary School in Kocasinan district of Kayseri which is located in the middle of Turkey during 2011-2012 academic year (8 units, 320 students). Sample of the study was determined according to purposive sampling which is one of non-probability sampling types. In purposive sampling, which is also called as judgement sampling, researcher uses his/her own judgement about whom to select and includes those who are most appropriate to the purpose of the research (Balcı, 2004: 90). Taking these principles into consideration, 7-F class of the above mentioned school was accepted as experiment group while 7-B class was accepted as control group. Some of the qualities included in independent variables of experiment and control groups are as follows: 51,51% of students are female and 48,48% is male. 7,57% of students is single child, 27,27% of students has one sibling apart from himself, 42,42% has two siblings apart from himself, 18,18% has three siblings apart from himself and 4,54% has four or more siblings apart from himself. The rate of students whose mothers are primary school graduates is 45,45%, the rate of students whose mothers are secondary school graduates is 27,27%, the rate of students whose mothers are high school graduates is 24,24% and the rate of students whose mothers are university graduates is 3,03%. The rate of students whose fathers' education level is primary is 18,18%, the rate of students whose fathers' education level is secondary is 31,81%, the rate students whose fathers' education level is high school is 33,33% and the rate of students whose fathers' education level is university is 16,66%. 6,06% of students are from low, 77,27% is from medium and 16,66% is from high level income families. 16,66% is living with extended family and 83,33% is living with a nuclear family. Besides, while 28,78% of experimental objects is attending training centre, 71,21% is not.

Data Collection Instruments

As data collection instruments, "Studying Habits Inventory" developed by (1) Uluğ (1981) and Achievement Tests for 7th Grade Students of Refika Küçükçalık Primary School (1st Pilot and 2nd Pilot Exams) (2) were employed.

There are explanations below in relation to them.

(1)- Studying Habits Inventory:

Studying Habits Inventory consists of 60 questions in total. First 50 questions of these are related to intended habits (starting studying, making plans, note-taking, summarizing, preparing for exam, studying individually, and in groups, organizing studying environment, efficient reading, and listening). Last 10 questions in inventory were prepared as control items to check the accuracy of the answers. Reliability of Studying Habits Inventory was defined as 0.79 correlation coefficient which was obtained as a result of test-retest method applied on experiment group containing 16 people in 1981.

(2)- Achievement Tests for 7th Grade Students of Refika Küçükçalık Primary School:

Achievement tests are tests which are periodically applied in primary schools by Ministry of National Education to prepare students for Placement Tests which are implemented for placing students in high schools and to test student achievements. In this study, first and second Achievement Tests from the abovementioned tests were employed.

Collecting Data

Table 1. *Data Collecting Process*

Groups	*Pre-Test*	*Process*	*Post-Test*
Experiment Group	Studying Habits Inventory 1st Academic Achievement Test (Pilot Test)	Implementing Efficient Studying Skills Curriculum for 4 weeks	Studying Habits Inventory 2nd Academic Achievement Test (2nd Pilot Exam)
Control Group	Studying Habits Inventory 1st Academic Achievement Test (Pilot Test)		Studying Habits Inventory 2nd Academic Achievement Test (2nd Pilot Exam)

As seen in Table 1, students were applied Studying Habits Inventory and Academic Achievement Test for 7th Grade Students of Refika Karaçalık Primary School at the beginning of experimental operation. Afterwards, students in experimental group were applied *Curriculum for Developing Efficient Studying Skills*. Curriculum for Developing Efficient Studying Skills was completed in four weeks with two applications in each week which made 8 applications in total. Meanwhile, control group students were not put subject to any operation. After the implementation of Curriculum for Developing Efficient Studying Skills, Studying Habits Inventory and Achievement Test for 7th grade Students of Refika Karaçalık Primary School were applied as post-test and the results were compared.

Curriculum for Developing Efficient Studying Skills:

Curriculum for Developing Efficient Studying Skills, which was planned to support development of students' efficient studying skills, was prepared in accordance with the systematic below.

Initially, target for curriculum were determined. Related literature was taken into consideration while determining the targets. Afterwards, scope of Curriculum for Developing Efficient Studying Skills was set. Setting of the scope was based on review of related literature. At this stage, the place where education will take place, implementer and experimental objects were determined. The scope was formed in such a way that it will aid acquisition of the targets. Also, it is appropriate for different learning and teaching activities, and reasoning. At the beginning of each activity, student opinions regarding that day's topic were taken and they were informed about the subject. Students were asked to discuss lectured subject with the group and to compare their old knowledge with the new information they had learnt. They were made to conduct reasoning by presenting various sample events. Curriculum for Developing Efficient Studying Skills employed lecturing, question-answer, discussion, sample event, and brainstorming methods during the education process. White board, photocopy notes, projection machine, and related slide shows were utilized as learning material.

Targets of Curriculum for Developing Efficient Studying Skills are as follows: (1) Knowledge of determining target. (2) Organizing the study environment and starting to study. (3) Conceiving the obstacles against efficient studying. (4) Conceiving the steps of planning time. (5) Conceiving the steps of efficient reading. (6) Conceiving the steps of efficient listening. (7) Proper note-taking and doing homework. (8) Comprehending the importance of repeating. (9) Being able to evaluate Curriculum for Developing Efficient Studying Skills. As for the scope of the curriculum it contains; (1) Determining target. (2) Organizing the study

environment. (3) Starting to study. (4) Planning. (5) Efficient reading. (5) Efficient listening. (6) Note-taking. (7) Repeating. (8) Evaluating the curriculum.

Data Analysis

Obtained data were analysed employing Covariance Analysis (ANCOVA). "ANCOVA is used to determine whether there is a statistically significant difference between groups" (Büyüköztürk, 2007: 47-48). Therefore, "if the researcher is focused on whether the experimental operation was effective or not in a pattern with pre-test/post-test control group, the most appropriate statistical operation is the single factor ANCOVA in which pre-test is considered as the common variable" (Büyüköztürk, 2004, s. 106). Due to this quality of ANCOVA, data of this research were analysed using this method. At least .05 level of significance was taken as basis in these analyses.

Findings and Commentary

Is there a significant difference between Post-Test Scores of students from experiment and control groups which they got from the entire Academic Achievement Test?

This sub-problem, which was taken as covariant that is changing with pre-tests, was tested via Covariance Analysis (ANCOVA). To this end, arithmetic average of pre-test and post-test scores of students from experiment and control groups which they got from "*The Exam for 7th Grades Implemented by Refika Küçükçalık Primary School*" were corrected according to pre-test with standard deviation and arithmetic average values regarding post-test were determined. In this sense, pre-test arithmetic average of experiment group is 217,0 and standard deviation is 46 while arithmetic average of control group for pre-test is 217,3 and standard deviation is 46,6. Post-test arithmetic average of experiment group is 228,2 and standard deviation is 38,8 while arithmetic average of control group for post-test is 217,6 and standard deviation is 39,6. Arithmetic average of experiment group for post-test which was corrected according to pre-test scores is 228,40 while this score was calculated as 217,51 for control group. This data show that post-test average scores of experiment group which were corrected according to pre-test named "The Exam for 7th Grades Implemented by Refika Karaçalık Primary School" are higher than those of control group. ANCOVA test was applied in order to reveal how to interpret this difference between groups statistically. Results of this test are given in Table 2.

Table 2. *ANCOVA Analysis Results Applied for Entire Academic Achievement Test*

Source	*KT*	*Sd*	*KO*	*F*	*p*
Model	89971,429	2	44985,714	268,303	,000
Covariant	88096,356	1	88096,356	525,42	,000
Group	1956,165	1	1956,165	11,667	,001
Error	10563,074	63	167,668		
Total	100534,502	66			

When Table 2 is examined, it is seen that there is a significant difference between post-test academic achievement score averages of groups which were corrected according to re-test academic achievement test ($F(1\text{-}63)=11.667$, p <.05). ANCOVA model defining this is significant [$F(2;63)= 268,303$, p <.05]. This finding indicates that academic achievement test scores of students change significantly depending on the implemented experimental operation.

Is there a significant difference between Post-Test Scores of students from experiment and control groups which they got from the entire Efficient Studying Skills Habit Inventory?

This sub-problem, which was taken as covariant that is changing with pre-tests, was tested via Covariance Analysis (ANCOVA). To this end, pre-test and post-test arithmetic average of students from experiment and control group which they got from "Studying Habits Inventory" were corrected according to pre-test with standard deviation and arithmetic average values regarding post-test were determined. In this sense, pre-test arithmetic average of experiment group is 28,3 and standard deviation is 4,8 while pre-test arithmetic average of control group is 27,3 and standard deviation is 7,6. Post-test arithmetic average of experiment group is 34,3 and standard deviation is 5,4 while post-test arithmetic average of control group is 28,6 and standard deviation is 6,3. Post-test arithmetic average of experiment group which were corrected according to pre-test scores is 34,2 while this score is 28,7 for control group. This data shows that experiment group has higher post-test average scores which were corrected to pre-test named as "*Studying Habits Inventory*" than control group. ANCOVA test was implemented to see if this difference between groups is statistically significant. Results of the related test are given in Table 3.

Table 3. ANCOVA Analysis Results Implemented for Entire Efficient Studying Habits Inventory

Source	*KT*	*Sd*	*KO*	*F*	*p*
Model	564,710	2	282,355	8,064	,001
Covariant	40,528	1	40,528	1,158	,286
Group	497,307	1	497,307	14,204	,000
Error	2205,775	63	35,012		
Total	2770,485	65			

When Table 3 is examined, it is seen that there is a significant difference between groups in terms of post-test score averages they got from efficient studying habits inventory which were corrected according to pre-test efficient studying inventory scores of groups [$F(1-63)=14.204$, $p<.05$]. ANCOVA model defining this is significant [$F(2;63)= 8,064$, $p<.05$]. This finding indicates that student scores regarding efficient studying habits inventory change significantly according to the applied experimental operation.

Conclusion and Discussion

In relation to first sub-question of research, a significant difference on behalf of experiment group was detected between academic achievement levels of experiment and control group according to analysis results obtained from achievement test scores. As a result of comparison made between post-test scores of experiment and control group, first hypothesis of the research which was "there is a significant difference on behalf of experiment group between academic achievements of experiment and control groups" was confirmed. That post-test scores of experiment group are significantly different from control group is an indicator of the fact that curriculum for developing efficient studying skills was effective on increasing 7th grade students' achievements.

That teaching studying skills increases academic achievements of students was stated in different sources and previous research findings supported this claim were taken into consideration while creating the first hypothesis of the research. When related literature was reviewed; Bol, Warkentin, Nunnery and O'Connel (1999) detected a positive relationship between college studying habits survey and achievements of college students. Gonzales stated that there is a medium or high level of relationship between Spanish origin university students' studying habits and their grade point averages (Gonzales,1984, p. 2). Özbey (2007)

revealed that secondary school students with high level of mathematics achievements are more conscious than other students with lower level of mathematics achievement (Özbey, 2007, p. 97). Subaşı (2000) stated in his research that education regarding efficient studying habits increases students' academic self-concept levels and academic achievements. Jegede and Jegede (1997) denoted in their study that studying habits and academic motivation are related to each other positively. These results show that students' academic achievements increase as their efficient studying habits increase.

In relation to second sub-problem of the research, it was concluded that there is a significant difference between post-test studying habit inventory score averages which were corrected according to pre-test studying habits inventory scores of groups. This result expresses that there is a significant change in students' studying habits inventory scores depending on the applied experimental operation. This case confirmed the hypothesis that "there is a significant difference on behalf of experiment group in terms of efficient studying habits of experiment group and control group". These results can be evaluated as such; curriculum for developing efficient studying skills enable students organize the study environment and use some specific methods effectively such as efficient reading, listening lectures, note-taking, efficient writing and doing homework. In this sense, it is possible to say that it helps increasing student motivations.

Second hypothesis of research was created taking into account the fact that various sources state that students do not possess efficient studying skills adequately. Various research findings support this case (Fletcher, 1980; Uluğ, 1981; Subaşı, 2000; Kaya, 2001). Abovementioned researchers revealed that education, seminars and guidance regarding improvement of studying habits positively influence studying habits and attitudes. Besides, other findings obtained as a result of literature review showed that students do not use proper studying habits, more importantly; they fail since they cannot demonstrate studying behaviours (Yenilmez & Özbey 2007). In a research conducted by Zeyrek et al (1990), it was revealed that students are moderate in relation to the wish to study **(**eg., Memiş 2007). Another point to be emphasized is that 55% of students state that they consider the factor "I fail because I do not know how to study" as an important determinant for their failures (Olcay & Döş, 2009). Derviş (1993) in his study examining the effect of group work on student studies came to the conclusion that group work positively influence achievement and it makes students acquire the habit of planned studying, self-confidence and sense of responsibility. In addition, it was revealed by various researches that students with proper studying skills and habits are academically successful as well (Uluğ, 1981; Schultz, 1989; Elliot et al, 1990; Slate et al, 1990; Jones et al, 1993; Lawler, Slate & Jones, 1993; Agnew et al, 1993; Gordon, 1997; Ley & Young, 1998; Sünbül et al, 1998; Carter, 1999; Arslantaş, 2001; Memiş, 2007, Özsoy, Memiş & Temur, 2009).

As a result, this research indicated that students can acquire efficient studying skills by means of Curriculum for Developing Efficient Studying Skills and they increase their academic achievements thanks to these studying habits. In this sense, if quality of education is desired to be increased, students with high level of academic achievements are intended and growing youth is expected to compete with the young population of other states with the effect of globalization, it is necessary to make students acquire efficient studying skills. To this end, legal regulations can be made for the preparation of Curriculum for Developing Efficient Studying Skills. Teachers of all grades can be given seminars regarding the Development of Efficient Studying Skills. In departments educating teachers, information concerning the how to teach efficient studying skills can be covered by pedagogical formation courses. Besides, activities in relation to implementation of this curriculum can be

practiced in practical courses. In addition, repeating this study with different groups, different content and different educational approaches may be beneficial as well.

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Tablet vs. Paper: The Effect on Learners' Reading Performance

Hakan DUNDAR *
Kırıkkale University, Turkey

Murat AKCAYIR
Kırıkkale University, Turkey

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Abstract

The purpose of this study is to compare primary school 5th-class students' electronic text reading performance, reading speed and reading comprehension with tablet PCs and printed books. This study examined a sample of 20 students. The students were randomly divided into two groups, a control group and a treatment group. The control group students read ordinary printed books, and the students in the treatment group read the same text on an electronic tablet PC display. Both qualitative and quantitative data collection tools were used for the study. Qualitative data were collected on the reading speed and reading comprehension skills for both groups of students. Statistically, there was no significant difference between the groups in reading speed or the level of reading comprehension. Students' opinions on tablet PCs and recommendations for future studies are also discussed.

Keywords: Tablet PC, Elementary Education, Human-Computer Interface, Media in Education

Introduction

The continuous development of computer technology and software provides an opportunity for the efficient transfer of data, course notes and images from paper to an electronic environment. As a result of this development, people often prefer to access information on computers because of the accessibility of the information, the ability to change text to the desired size, ease of archiving and organization, the avoidance of paper costs and reduction of paper use, and environmental benefits (Dyson & Haselgrove, 2001; Garland & Noyes, 2004; Rose, 2011; Spencer, 2006). In addition to the widespread use of the internet for obtaining information, university libraries are moving to the use of e-books and e-magazines. Increased e-mail traffic, the availability of computer-supported training and the power of multimedia

* Hakan Dundar, Kirikkale University, Faculty of Education, Department of Elementary School Education, Kirikkale, Turkey, Phone:+903183572488 E-mail: hdundar06@gmail.com

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are factors that contribute to the wide use of computers for accessing information and reading texts (Hanson, 2008; Hezroni, 2004; Levine-Clark, 2006; Littman, 2002; Reinking, 1997; Slater, 2009; Snyder, 2002; Turbill, 2001; Woody, Daniel & Baker, 2010). There has been a significant increase in e-book production and sales (Peek, 2005). Computers play an active role in distance education, further increasing the rate of use of electronic texts (Dyson & Haselgrove, 2000). As a result of this situation, electronic texts have superseded traditional printed paper (Rose, 2011), raising the question of the environment in which electronic texts are most efficient.

Literature review

Many previous studies have examined the shift from printed text to electronic texts due to the widespread use of personal computers in the 1980s (Mills & Weldon, 1987; Dillon, 1992). The findings of these studies suggest that it is 20-30% slower to read a paper printout compared with an electronic text (Muter et al., 1982; Gould & Grischkowsky, 1984; Gould et al., 1986; Mayes, Sims, Koonce, 2001). A study conducted by Wagner and Sternberg (1987) determined that students reading electronic texts were capable of understanding the main theme of the text, but they were not capable of remembering the details of the text. Computer use is tiresome compared to reading a book, and computer displays cause eye fatigue. Therefore, the use of electronic texts remains low in comparison with printed texts (Kropman, Schoch & Yeoh, 2004; Young, 2000). In recent years, this situation has continued despite developments in technology and software. Readers continue to experience physical problems and decreased performance when reading electronic texts, and they prefer printed texts (Woody, Daniel & Baker, 2010).

Studies have also examined why e-books are ineffective when compared to printed texts. Paper has been found to be more effective because readers are able to browse electronic texts more easily, reducing their ability to remember the details of a text (Muter & Maurutto, 1991; Nielson, 1997; Rho & Gedeon, 2000). According to Garland and Noyes (2004), the vibrations that occur when CRT monitors refresh negatively affect reading performance. According to Blanco and Leirøs (2000), because CRT monitors are brighter than paper, readers prefer printed paper to reduce eye fatigue. Another reason for this preference is that the brightness of a monitor negatively affects brain activities, thereby reducing efficiency (Kammer, Lehr & Kirschfeld, 1999). Belmore (1985) concluded that people who used computer monitors more often read faster and more effectively than people reading printed texts. Dyson and Haselgrove (2000) similarly concluded that people with experience reading on computer monitors have increased reading speed and comprehension levels. According to Carlson (2002), it is very tiresome for e-book users to navigate pages, and it is difficult for readers to advance to a desired section.

In the 2000s, LCD monitors began to be used rather than the larger CRT monitors that were not suitable for reading. LCD monitors were expected to solve these technical problems as the use of laptops became widespread. However, studies found that computer monitors were technically difficult to use and placed a physical strain on users (Dockrell, Earle & Galvin, 2010; Woody, Daniel & Baker, 2010). Furthermore, readers found it boring to interact with the mouse and to be unable to touch the text. The physical contact and the scent of the paper is important for readers. For this reason, rather than spending extended amounts of time looking at a monitor, readers prefer to read books that they can hold in their hands (Spencer, 2006). The results of a study by Woo (2005) on 2654 students found that 71.8% of the students preferred paper texts. The findings of a study by Shepperd, Grace, and Koch (2008) showed that 90% of students preferred textbooks, despite the greater accessibility and lower cost of e-books.

Purpose

Comparisons of reading on e-books and on printed paper suggest that reading performance and readers' choices are always to the detriment of e-books (Garland & Noyes, 2004; Kropman, Schoch & Yeoh, 2004; Young, 2000). Readers prefer printed texts due to ergonomic challenges in computer use (eg., Dockrell, Earle & Galvin, 2010; Levine-Clark, 2006; McGrail, 2007; Woody, Daniel & Baker, 2010) and eyestrain caused by CRT or LCD displays (eg., Blanco & Leirøs, 2000; Garland & Noyes, 2004; Kropman, Schoch & Yeoh, 2004; Nishiyama, 1990; Rose, 2011; Wu, Lee, Lin, 2007; Young, 2000). Therefore, developments in technology must attempt to overcome the disadvantages of e-books. This situation has been noted in the literature in studies investigating readers' interactions with e-books and ways of reducing the physical challenges imposed by e books (eye fatigue, navigation, lumbar pain etc.) (Woody, Daniel & Baker, 2010). A solution to these problems with e-books may be provided by tablet computers, such as the iPad 2 and CRT and LCD displays. The iPad 2 is quite thin, small (9.7 inches) and light (603 gr) when compared to other laptop and desktop computers. It is easier to handling and use than other computers. The touchscreen of the iPad 2 allows users to perform their work more easily. The iPad 2's touchscreen, ergonomic design, ability to open electronic documents in many formats (for example, doc, docx, and pdf) and interactive use make it powerful (Apple, 2012). Users can read a text as easily as reading a book by holding the tablet.

Projects have been developed by the Ministry of National Education in the Republic of Turkey to provide tablet computers to students. Various educational products will be distributed to schools in Turkey for the project called F@TİH (Initiative to Increase Opportunities and to Develop Technology), which commenced in 2010. The project was expected to be completed in four years with a budget of approximately $1 billion. This project will distribute products such as smart boards, projectors, and tablet PCs to all state schools (Ministry of National Education [MEB], 2010). The pilot scheme began with 51 schools of 5th- and 9th-class students in the spring period of the 2011- 2012 educational year.

The reading performance of 5th-class students on tablet computers and printed texts was assessed in detail, and students' opinions on the tablet PCs were collected.

Method

This study used an experimental design described by Campbell and Stanley (1963). Students were randomly assigned to the treatment and control groups. Three texts available in the 5th-class Turkish course were read by both groups. Normal printed texts were used by the control group, and tablet PCs were used by the treatment group.

Both qualitative and quantitative data collection tools were used for this research. Quantitative data allows us to investigate the effects of tablet PCs for reading. Qualitative scales allow us to investigate students' behaviors with tablet PCs and the effects of tablet PCs on the reading process. The purpose of this research was to determine whether the tablet PC produced a statistically significant increase or change in students' academic performance and behavior.

Participants

This research was conducted at Toki primary school, located in Kırıkkale city center in Turkey, during the 2011-2012 academic year. Twenty fifth-grade primary school students aged 11-12 years participated in the study. Ten students were randomly assigned to the treatment group, and 10 students were randomly assigned to the control group.

Instruments

Data were collected through quantitative and qualitative instruments, including interviews and reading performance tests. Three reading texts were conducted to determine students' oral reading speed and their reading comprehension levels. These reading tests included texts that were not previously encountered by the treatment and control groups. The texts were Turkish course books for 5th-grade students approved by the Head of the Council of Education and Morality in 2007 by the MEB (Gören, Yener, İldeniz, Aksal & Sarıöz, 2007). Digital printouts were taken from the MEB Publication Department to allow the treatment group to read these texts on tablet PCs. Eleven questions were posed about the texts Sound of Our Heart, You Can be an Inventor and Miniaturk. The questions were prepared based on the opinions of two academicians, one in primary school teaching and the other in Turkish teaching, and two class teachers. Four of the questions intended to measure comprehension were related to perceiving, and 7 were simple comprehension questions. A summary question covered the main theme and the entire text for the in-depth perception questions. Questions were included about the title and content of the text for the simple perception questions. A reading period (min.) section was added to each test. An interview was performed after the implementation of the reading test to obtain opinions from all of the students in the treatment group about the experience of reading on the tablet PC. Three interview questions were prepared about the students' use of tablet PCs:

- Do you prefer a tablet computer or a book to read texts? Why?
- Would you like to have all of your other books on the tablet PC?
- Did you have problems with the use of the tablet PC?

Data analysis

Reading speed was calculated by the number of words read correctly in 1 minute (Erden, Kurdoğlu and Uslu, 2002). The level of reading comprehension was calculated using Akyol's (2003) chart for understanding. The grading system is indicated in the following table 1.

Table 1. *Grading Table for Percieving Questions*

Answer	Grade
No answer	0
Half – answered	1
Fully answered	2

To examine the effects of tablet PCs on learners' reading performance, an independent *t*-test was used. Reading speed and comprehension were used as dependent variables, and the reading environment (tablet PC or hard copy) was used as an independent variable. The significance level for all tests was set at the $p < .05$ level. An analytical seven-stage process, as recommended by Deikelmann (1989), was utilized by one researcher to analyze the data from the interviews (see Table 2).

Table 2. *Deikelmann (1989) Seven Stages of Analysis*

1. Reading the interviews, reflective journal, literature and SD results to obtain an overall understanding.
2. Writing interpretive summaries and coding for possible themes.
3. Analyzing selected transcripts as a group in order to identify themes.
4. Returning to the text or to the participants for clarification of disagreements in interpreting and writing a composite analysis of each text.
5. Comparing and contrasting texts to identify and describe shared practices and common

meanings.
6. Identifying constitutive patterns that link the themes.
7. Eliciting responses and suggestions on a final draft from a colleague familiar with the content and or methods of the study.

Procedure

In this quasi-experimental study, 10-person student groups were determined randomly. Both groups were tested in the students' classrooms. All students performed their reading independently (see Figure 1). During the reading process, the researchers noted the number of words read incorrectly by the students for the entire period. After the reading process was completed, questions relevant to the text were asked of the students. Interviews were organized with the students in the treatment group after the students read all of the text. The students in the treatment group used tablet PCs on normal desks. The students in the control group read the same texts in their books.

Figure 1: Treatment group

Tablet PCs were introduced to all students in the treatment group by the researchers prior to the experiment, and brief information was given about their use (see Figure 2). None of the students had any problems with the use of the tablet PCs during the application of the test.

Figure 2: Introducing tablet PC

The grades of both groups of students in their 4th-grade Turkish courses were compared with their reading speeds for a text called "Fault Lines' Movements" (Gören et al, 2007) based on the averages of their grades in reading comprehension.

Table 3. *Comparisons Made for the Balance of Two Groups before Implementation*

Group	Reading speed				Reading Comprehension				Academic success			
	X	ss	t	p	X	ss	t	p	X	ss	t	p
Control	105.0	23.89	.404	.69	3.70	1.41	.16	.87	80.40	13.09	.019	.98
Treatment	108.6	14.90			3.60	1.26			80.50	10.28		

It was determined that there was no significant difference in reading comprehension between the two groups as a result of the previous tests. Thus, the treatment and control groups were assigned randomly.

Results

Reading speed and comprehension

According to the independent *t*-test results, no significant difference was found for reading speed or reading comprehension of the treatment group and the control group (see Table 4). The students' reading speeds were identified by the number of words they read per minute.

Table 4. *Independent t-Test of students' Reading Speed*

Group	N	X	ss	Sd	t	p
Control	10	107.43	19.14	18	0.811	.428
Treatment	10	101.83	10.50			

Table 4 shows that the number of words read by the treatment group per minute was 107.43, and the number of words read per minute by the control group students was 101.83. Although the average number of words read by the control group students per minute was higher than the treatment group, this result is not statistically significant (t= 0.811, $p > .05$). There is no difference between the reading speeds of the students with the tablet PC or the printed text.

No significant difference was found for reading comprehension in the treatment and control groups (see Table 5). The success levels of the students were assessed over 20 points.

Table 5. *Independent t-Test Of Students' Reading Comprehension*

Group	N	X	ss	Sd	t	P
Control	10	4.93	0.87	18	0.67	.507
Treatment	10	5.16	0.65			

Although the average success level of the treatment group is higher than the control group in Table 5 (5.16 and 4.93), this result is not statistically significant (t= 0.67, $p > .05$). In other words, there is no difference in reading comprehension between the groups using the tablet PC and the printed text.

Qualitative results

The interviews lasted approximately 10 minutes. The one-on-one interviews produced two themes relating to reading from tablet PCs.

Theme one – ergonomics and ease of use of the tablet PC

The students commented that the tablet PCs were very ergonomic. They found it easy to change the size of the characters on the display and to turn the pages and found the tablet PCs to be lightweight. Students S1 and S4 expressed these opinions, as follows:

[S1]: I liked tablet PCs very much. I can magnify letters by turning the tablet or manually. Letters are legible. Letters are small in books and books are heavier.

[S4]: It was very easy to use the tablet PC. I think it is better than books. I can easily open pages. I don't even need to carry a bag. It is hard to carry bags.

Theme two – enjoyable to read from tablet PC

All of the treatment group students mentioned that reading texts on the tablet PC was entertaining when compared to reading from books. Some of the students (30%) wanted to read all of their books on the tablet PC. Tablet PCs are very light when compared to books, making tablet PCs a pleasant reading tool. Students S5 and S2 offered the following statements:

[S5]: It is very enjoyable, amusing and easy to read on the tablet. Lighter when compared to books. I would like to read all of my books on this.

[S2]: Tablet PCs are much more fun. I can magnify letters. I think it is easier and enjoyable to read on this.

Discussion

This study compared the text reading performance, comprehension and number of words read per minute of 5th-grade students with students who read from printed text. Many studies have examined the widespread use of e-books in literature and their increasing use. Studies have suggested that people do not prefer electronic books and have suggested that they are ineffective (Shamir & Shlafer, 2011). In this study, electronic books were considered to remove physical and ergonomic difficulties. According to the findings of this study, tablet PCs are effective tools for reading electronic texts. The availability, display quality and ergonomics of tablet PCs have positive effects on students. Students can easily read the text by holding the PC like a book. Tablet PCs can be used in both horizontal and vertical positions, which positively affects reading because rotating a tablet PC to a horizontal position provides a wider reading area. Moreover, students are able to adjust the size of the text, allowing them to read more comfortably.

In similar studies, electronic texts were compared to normal printed texts. However, this method has consistently been detrimental to electronic texts (Garland & Noyes, 2004; Kropman, Schoch & Yeoh, 2004; Young, 2000). In this study, there was no significant difference in either reading speed or reading comprehension between the two groups. In other words, there was no difference between reading the same text in printed form or on a tablet PC. These findings suggest that tablet PCs can be an effective solution for the ergonomic and physical problems of reading electronic texts. Tablet PCs are more user friendly than other types of displays (CRT and LCD). Ergonomics is one of the most significant factors in making electronic texts less effective than printed texts (Levine-Clark, 2006; McGrail, 2007; Woody, Daniel & Baker, 2010). Students can easily read a text by placing a tablet PC on their desktop, whereas looking at a monitor for an extended period is both boring and tiresome. The ergonomic qualities of tablets are also important to allow them to be used for other purposes. For example, tablet PCs would be more effective than other types of displays for students watching educational videos or playing educational games. Ergonomics is one of the major factors affecting education in schools (McGrail, 2007). When students find computers ergonomically difficult, their learning process becomes more difficult, and their attitudes toward technology may be negatively affected (Dockrell, Earle & Galvin, 2010).

All of the students in the treatment group exhibited positive attitudes toward tablet PCs. Students preferred tablet PCs to reading printed books because books are heavier and difficult to carry. It is much easier for students to carry a tablet PC than to carry many books. This is an important factor in the students' preference for tablet PCs. Moreover, the students note that it is entertaining to read books on the tablet PC. The researchers observed that the students immediately adapted to the use of tablet PCs.

Conclusion and recommendations

In today's world, computer technology continuously develops and increases its field of application in every sector. In the field of education, computer technology continues to expand its sphere of influence through various applications and projects. Interactive applications in education, such as the utilization of enriched texts in courses, suggests that the effectiveness of computer technologies will increase in educational environments. The F@TİH project plans to distribute tablet PCs to all students. There has been a significant increase in the preference for e-books for both personal and professional development. This study examined the reading speed and reading comprehension of primary school 5th-grade students by comparing tablet PCs and printed texts. There was no significant difference between the two groups in either reading speed or reading comprehension. However, this study found that students' opinions about the use of tablet PCs was significantly positive. In addition to the benefits of being ergonomic and easy to carry, students found the use of tablet PCs enjoyable. Further studies could examine students' silent reading performance and comprehension to determine reading difficulties and students' motivation for reading through comparisons of printed materials and tablet PCs. Additional studies can be planned to measure not only reading and comprehension but also academic success and students' attitudes about the courses available in primary and secondary education. Another phase of this study could be performed to examine teachers' attitudes toward tablet PCs and their level of utilization and application. Applications of tablet PCs for students can also be examined based on the opinions of teachers.

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Effects of Puppetry on Elementary Students' Knowledge of and Attitudes Toward Individuals with Disabilities

Carl J. DUNST*
Orelena Hawks Puckett Institute, United States

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Abstract

Findings from two studies investigating the effects of Kids on the Block (KOB) puppet shows on elementary school students' knowledge of and attitude toward individuals with disabilities are described. KOB is a troupe of life-size hand-and-rod puppets used to improve knowledge and change attitudes toward persons with disabilities. Results from both studies indicated that KOB performances had positive effects on both the knowledge and attitudes of second, third, and fourth grade students. Study 1 showed that the puppet show participants had more positive attitudes and more accurate factual knowledge of individuals with disabilities compared to the control group participants who did not experience the KOB puppets. Findings from Study 2 showed pretest-post test gain scores for the KOB group were larger than those for the control group. The results taken together provided evidence that a rather simple intervention was effective in terms of changing the knowledge of and attitudes toward individuals with disabilities.

Keywords: Elementary Students, Puppetry, Knowledge, Attitudes, Individuals with Disabilities

Introduction

The knowledge and attitudes of people in general (Scior, Kan, McLoughlin & Sheridan, 2010), and children more specifically (Nowicki & Sandieson, 2002), toward individuals with disabilities has been the focus of description and investigation for many years (Garcia, Diaz & Rodriguez, 2009; Yuker, 1988). Research shows that misunderstandings of and negative attitudes toward individuals with disabilities often interfere with their acceptance and full inclusion into school and society (Lipsky & Gartner, 1996). Research also shows that many children as young as 4 or 5 years of age have already developed misconceptions about and

* Carl J. Dunst, Research Scientist, 8 Elk Mountain Rd., Orelena Hawks Puckett Institute, Asheville, North Carolina, USA, 28804. Phone: 828-255-0470. Email: cdunst@puckett.org

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negative attitudes toward individuals with disabilities (see Favazza & Odom, 1997) and that these beliefs and understanding's continue to be characteristic of elementary school age children in the absence of any attempts to improve knowledge or change attitudes (Nowicki & Sandieson, 2002). Many different types of interventions have been used to change young children's knowledge of and attitudes toward individuals with disabilities (Donaldson, 1980; Garcia et al., 2009; Shapiro, 2000). These include, but are not limited to, awareness and knowledge transmission programs (Garcia et al., 2009), empathy-related experiences (Lockhart, French & Gench, 1998), puppet plays (Pitre, Stewart, Adams, Bedard & Landry, 2007), simulations of disabling conditions (Hutzler, Fliess-Douer, Avraham, Reitner & Talmor, 2007), and multi-media curriculum (Hazzard & Baker 1982). One intervention that has been widely used is the Kids on the Block (KOB) puppets (Aiello, 1988). KOB is a troupe of life size hand-and-rod puppets of children with and without disabilities. The goal of KOB is to dispel misconceptions and promote positive knowledge of and attitudes toward individuals with disabilities. The original puppet troupe, which has been the primary focus of research and practice, includes children with a physical disability (cerebral palsy), intellectual disability (Down syndrome), visual impairment, and hearing impairment. KOB has been performed extensively throughout Canada (e.g., Baker, 1991; Snart & Maguire, 1986) and the United States (e.g., Baker, 1994; Schumacher, 1998) as well as in more than 30 other countries (Leggett, 2005).

Studies of the effects of the KOB puppets on either or both the knowledge and attitudes of elementary age school children toward individuals with disabilities has produced mixed results (e.g., Gilfoyle & Gliner, 1985; Rosenbaum, Armstrong & King, 1986b; Snart & Maguire, 1987). Close inspection of studies of KOB indicate that the conflicting findings may be due to differences in the rigor of the research designs and data analysis methods used to evaluate the effectiveness of the puppet shows. This includes the use of different types of research designs, differences in the study sample sizes, the use of different measurement scales, and data analysis procedures. The purpose of the two studies described in this brief report was to assess differences and changes in the knowledge and attitudes of elementary school students toward individuals with disabilities. More specifically, the studies included large samples of students randomly assigned to intervention and control groups where traditional statistical analysis procedures were supplemented by effect size calculations (Thompson, 1999) to ascertain the magnitude of the influence of the KOB puppet shows on students' knowledge and attitudes.

Method

Participants

The participants in the two studies were 966 second, third, and fourth grade students in 40 classrooms in six elementary schools in one school district in the southeast United States. The participants in the first study included 170 second graders (83 male, 87 female), 154 third graders (84 male, 67 female), and 190 fourth graders (101 male, 89 female). The participants in the second study included 158 second graders (81 male, 77 female), 149 third graders (78 male, 71 female), and 145 fourth graders (78 male, 67 female).

Procedure

The KOB puppet show performances were conducted in the manner prescribed by the KOB developers (Kids on the Block Inc., 2012). Puppeteers (early childhood professionals) received extensive training on the 4 or 5 scripts for each puppet prior to conducting the shows. Each KOB puppet described his or her disability; misconceptions associated with his or her condition; the similarities and differences between him or herself and other children; his or her interests and capabilities; and their social relationships with peers and friends. Each

puppet show lasted between 45 and 60 minutes followed by a question-and-answer period where participants had the opportunity to comment on and pose questions to any of the puppets.

A 20-item true-false knowledge and attitude scale was used to evaluate the effects of KOB puppet performances on the students' beliefs and understanding. Items on the *Children's Knowledge About Handicapped Persons Scale* (Hazzard 1983) and the *Children's Attitude Toward Handicapped Peers Scale* (Voeltz, 1980) were used to develop the 20 item scale. The coefficient alphas for the 10 knowledge items and 10 attitude items were $\alpha = 0.88$ and $\alpha = 0.89$ respectively. The students also completed a 6 item true-false investigator-developed familiarity-with-persons-with-disabilities scale which was used as a covariate in the analyses of the students' knowledge and attitude responses since research has found that a students' prior experiences with individuals with disabilities influences their knowledge and attitudes (e.g., Maras & Brown, 2000; Rosenbaum, Armstrong & King, 1986a). Students completing pretests did so one week before the puppet shows. The post test was administered to all students one month after the completion of the puppet shows.

Method of Analysis

Half of the six elementary schools were randomly selected for Study 1 and the other three schools were included in Study 2. In each of the two studies, one elementary school was randomly assigned to participate in the KOB puppet show (intervention group) and the other two schools were the control groups. (All students in all schools subsequently experienced the KOB puppet shows after the two studies were completed.) Study 1 employed a 2 Between Group (Intervention vs. Control) X 3 Between Grade (2 vs. 3 vs. 4) Analysis of Covariance (ANCOVA) with the post test knowledge and attitude scores as the dependent measures and the students' familiarity scores as the covariate. Study 2 employed the same research design with the pretest-post test gain scores as the dependent measures for the reason described below.

Statistical significance testing was supplemented by Cohen's *d* effect sizes (Thompson, 1999) for the mean differences between the intervention and control groups which were used for substantive interpretation of the findings. It is now a generally recommended and accepted practice to use effects sizes rather than significance testing for ascertaining the magnitude of an intervention effect (Vacha-Haase & Thompson, 2004). A Cohen's *d* smaller than 0.20 is considered insignificant, a *d* between 0.20 and 0.49 is considered a small (but important) effect, a *d* between 0.50 and 0.79 is considered a medium effect, and a *d* equal to or greater than 0.80 is considered a large effect (Cohen, 1988).

Results

Study 1

Table 1 shows the adjusted mean scores and standard deviations for both the intervention and control groups and both the *p*-values and Cohen's *d* effect sizes for the between group differences for both outcome measures for each grade separately and for all grades combined. The ANCOVA for the post test knowledge scores produced a significant between grade difference, $F(2, 507) = 20.37$, $p = .0000$, and a significant between group difference, $F(1, 507) = 19.63$, $p = .0000$, both of which were qualified by a significant intervention group x grade interaction, $F(2, 507) = 5.36$, $p = .005$. The effect size for the mean differences between the intervention and control groups knowledge scores was $d = 0.41$ for all grades combined. Analyses of the group by grade interaction showed that the knowledge scores for the intervention group differed from that of the control group for Grade 2 and Grade 3 students (as evidenced by the sizes of effect) but not for Grade 4 students (as evidenced by a

insignificant effect size). This pattern of findings are shown in Table 1 in terms of both the *p* values and Cohen's *d* effect sizes for the between grade comparisons.

Table 1. *Means, Standard Deviations and Effect Sizes for the Between Group Post Test Comparisons (Study 1)*

	Intervention Group			*Control Group*			*Exact p-value*	*Cohen's d Effect Size*
Outcome Measure	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*		
Knowledge								
Second Grade	84	6.42	1.90	86	5.88	1.96	.0537	0.30
Third Grade	35	7.77	1.70	119	6.18	1.76	.0000	0.88
Fourth Grade	84	7.45	1.64	106	7.27	1.78	.4919	0.10
All Grades Combined	203	7.22	1.84	311	6.45	1.91	.0000	0.41
Attitudes								
Second Grade	84	6.36	1.62	86	6.12	1.90	.3679	0.14
Third Grade	35	7.52	1.20	119	6.50	1.88	.0016	0.61
Fourth Grade	84	7.75	1.23	106	6.97	1.69	.0016	0.47
All Grades Combined	203	7.21	1.55	311	6.53	1.85	.0000	0.38

Note. The mean scores are the adjusted averages partially out the effects of familiarity as the covariate.

The ANCOVA for the post test attitude scores produced a significant between grade difference, F (2, 507) = 20.24, p = .0000, and a significant between group difference, F (1, 507)= 17.71, p = .0000. The between grade difference showed that older students had more positive attitudes compared to younger students as evidenced by progressive increases in the attitude scores for both the intervention and control group from the second to the third to the fourth grades (Table 1).

The between group difference indicated that intervention group had more positive attitudes compared to the control group as evidenced by both a p = .0000 and a d = 0.38 for all grades combined. Further analysis showed the effect sizes for the differences in the students' attitude scores for the intervention and control groups were both medium for the Grades 3 and 4 mean differences but insignificant for the Grade 2 mean difference.

Study 2

Preliminary analyses of the adjusted pretest mean scores of the intervention and control groups found that the students' knowledge, F(1, 472) = 14.01, p = .000, and attitude, F(1, 472)= 6.32, p = .012, scores differed (favouring the intervention group) and therefore each students' gain score (post test score minus pretest score) was used as the dependent measure in the analyses of the effects of the KOB puppet shows. The ANCOVAs for both the knowledge, F(1, 445) = 35.68, p = .0000, and attitude, F(1, 445) = 18.78, p = .0000, pretest-post test gain scores showed that the changes on both outcome measures were larger for the intervention group compared to those for the control group.

The nature of the between group differences are shown in Table 2 for all grades combined and for each grade separately. Both the *p*-values and Cohen's *d* effect sizes for the between group differences showed that the KOB puppet show positively influenced changes in the students' knowledge of and attitudes toward individuals with disabilities. The between group differences were medium to large for 6 out of the 8 Cohen's *d* comparisons and all the *p*-values were statistically significant except one.

Table 2. *Means, Standard Deviations and Effect Sizes for the Pretest-Post Test Group Differences (Study 2)*

	Intervention Group			*Control Group*			*Exact*	*Cohen's d*
Outcome Measure	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*	*p-value*	*Effect Size*
Knowledge								
Second Grade	48	1.52	1.71	110	0.17	1.96	.0000	0.75
Third Grade	62	1.06	1.88	87	-0.16	1.92	.0001	0.68
Fourth Grade	50	0.95	1.65	95	0.38	1.55	.0707	0.32
All Grades Combined	160	1.18	1.77	292	0.13	1.83	.0000	0.58
Attitudes								
Second Grade	48	0.65	1.71	110	-0.13	1.91	.0099	0.45
Third Grade	62	0.59	1.42	87	-0.05	2.02	.0280	0.37
Fourth Grade	50	0.64	1.51	95	-0.15	1.52	.0099	0.45
All Grades Combined	160	0.62	1.53	292	-0.11	1.82	.0000	0.42

Note. The mean scores are the adjusted averages partially out the effects of familiarity as the covariate.

Discussion

Findings from Study 1 suggested that the KOB puppet shows had positive influences on the study participants knowledge of and attitudes toward individuals with disabilities. This was confirmed by the results from Study 2 where both significance testing and the effect sizes for the intervention and control group mean differences both provided support for the effectiveness of the KOB puppet shows. Taken together, the largest number of intervention vs. control group mean differences (14 out of 16) favoured the students who participated in KOB performances which indicated that the puppet shows had positive effect on both the knowledge and attitudes of elementary school students.

The sizes of effect for the KOB puppet shows were mostly small or medium which was not unexpected given the fact that the intervention lasted only 45 to 60 minutes for each group of students. What is perhaps most encouraging is the fact that such a simple intervention had discernable positive effect, and that the intervention could be delivered to a larger number of students on a single occasion. Inasmuch as elementary school students generally respond favourably to puppets as a medium for delivery of factual knowledge in an entertaining way (Bernier & O'Hare, 2005), KOB puppet shows would seem warranted and indicated as part of efforts to educate students without disabilities about individuals with disabilities (Garcia et al., 2009; Shapiro, 2000).

The extent to which the positive effects of KOB puppet shows are short or long term has been the focus of a number of investigations (Baker, 1991; Snart & Maguire, 1987). Snart and Maguire (1987) found that the effects of KOB puppet shows were still discernable 6 months after the completion of their intervention, and Baker (1991) found that intervention vs. control group differences were still detectable 12 months following the completion of her intervention. These two sets of findings reinforce the fact that KOB is an effective strategy for producing immediate and relatively long-term positive changes in the knowledge and attitudes of elementary school students.

Conclusion

Puppetry interventions in general (Binkard, 1985; Pitre et al., 2007), and the KOB puppets in particular (Aiello, 1988; Snart & Maguire, 1986), should be considered as at least one method for positively affecting changes in the knowledge and attitudes of elementary students' toward individuals with disabilities. This would seem to be especially the case in situations

where children with disabilities are included in regular and mainstream education (Flem, Moen & Gudmundsdottir, 2004; Nelson, 2000) which has increasingly become a method-of-choice for educating students with disabilities (Salisbury & Smith, 1991; Yell, 1995).

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Evaluating a Concept Mapping Training Programme by 10 and 13 year-old students

Anita HABÓK *
University of Szeged, Hungary

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Abstract

The PISA 2000 study found large differences between countries in terms of quality of learning. In some countries, students prefer rote learning to meaningful learning. However, such memorisation of the material does not lead to recallable and usable knowledge in the long run. Ausubel's (1968) well-known theory serves as a basis for several techniques of meaningful learning, including concept mapping, which emphasises the visual organization of comprehended information. The present study reports the results of an experiment using concept mapping for deepening students' understanding of teaching materials. It focuses on definitions frequently used in science and Hungarian grammar lessons. Results indicate that concept mapping training programmes can improve participants' achievement. Experiences show that the technique of concept mapping is frequently unfamiliar to students. More time would be needed for practising and using it in different learning situations.

Keywords: Meaningful Learning; Concept Maps; Training Programme

Introduction

In the process of teaching, two important questions arise. The first is how much fact and information students should learn. The second is in what way and in what textual form they should be presented. Successful learning is a widely researched topic (Csapó, 2007; Waeytens, Lens & Vandenberghe, 2002). Techniques and strategies that improve student achievement were investigated within the framework of these studies. When these learning methods are compared, the method of concept mapping is unique among visual learning techniques (Novak, 1990; 1998; Novak & Gowin, 1984). Concept mapping is widely used and has a variety of applications. Among others, it is used to explore prior knowledge (Gurlitt, Renkl, Faulhaber & Fischer, 2007), to visually represent texts (Hardy & Stadehofer, 2006), and to reveal problems (Barroso & Crespillo, 2008) and misconceptions (Berionni & Baldoni, 2004,

* Anita Habók, University of Szeged, 30-34. Petőfi S. sgt., Szeged, 6722, Hungary, Phone/FAX: (+36) 62-420-034. E-mail: habok@edpsy.u-szeged.hu

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Himangshu, Iuli & Venn, 2008). In general, it is a tool that is used to facilitate meaningful learning and help students to represent their knowledge in a visual form.

In Hungarian schools, grammar is one of the most problematic subjects. One reason for this is that schools place an artificial burden on students by an early introduction of grammatical definitions and rules in mother tongue education. The PISA 2000 results show that Hungarian students are relatively weak in using meaningful learning strategies that aid their conceptual understanding (Artelt, Baumert, Julius-McElvany & Peschar, 2003, 40). These results indicate that students have a preference for using memorizing strategies. However, in the long run, rote learning does not lead to recallable knowledge. Although rote learning can be useful for some learning purposes, the range of its possible applications is fairly limited. The problem arises when students use rote learning too frequently, and memorize information without seeking to establish connections between concepts. Therefore, rote learning should be replaced by meaningful learning, which helps foster a deeper understanding of things. This underlying assumption of the need for meaningful learning serves as the basis for our developmental programme. The goals of our programme are to be accomplished via the use of concept mapping.

There are numerous ways to visually construct concept maps. Below, I provide an example by Novak & Canas (2003, Figure 1.).

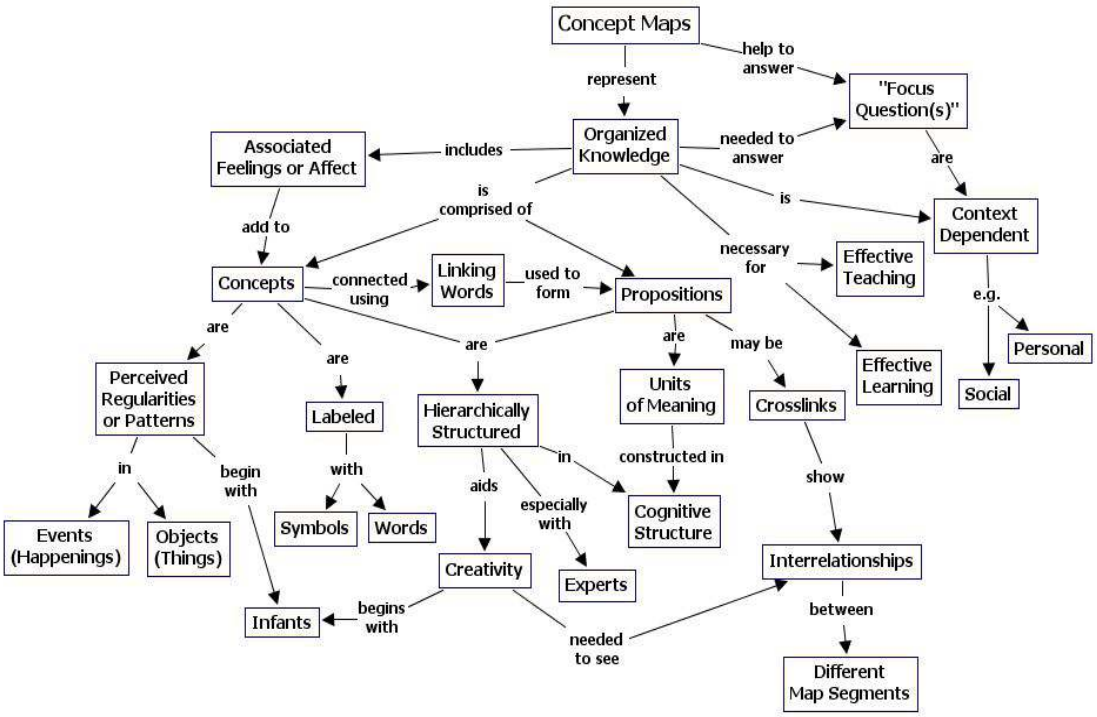


Figure 1. A concept map based on Canas & Novak (2008, 27) that shows the key features of concept maps in line with our definition.

Concept maps represent organized knowledge. They are composed of concepts that are connected by linking words. Two concepts and the interconnecting words make up propositions, which comprise units of meaning. In the cognitive structure, knowledge itself is built up of propositions which can be connected to each other. The proposition of concepts in the hierarchical structure depends on our creativity and prior knowledge. Concepts are stored in the form of objects and events, and they are labelled as symbols or words, which

may be connected by lines or arrows. In order to express the interrelationships between different levels we may use crosslinks. This kind of knowledge organization helps the process of teaching and learning to be more effective. In addition, concept maps help to answer focus questions that are context dependent.

Concept maps in practise

Concept maps have a wide range of uses. They are used in various areas, from kindergarten to higher education. Now we will focus on various ways of applying concept maps. For instance, Mancianelli et al. (2004) used concept maps to teach scientific language to 4-5 year old children. Children were provided with samples related to everyday topics like pumpkins and nests. The process of learning started with the activation of prior knowledge, when students carried out experiments with the objects at their disposal. After discussing the subject's properties, they drew a concept map. This early developmental technique attempted to acquaint children with concept mapping. Similarly, Berionni and Baldoni (2004) also applied concept mapping in early childhood. Berionni's and Baldoni's concept maps were part of everyday school life and were drawn either individually or within the frame of a group activity. Concept maps drawn by students informed teachers about students' misconceptions and the dynamic processes of their thinking.

Poveda and Oneca (2006) used the technique of concept mapping in elementary schools. Their goal was to study the development of the concept mapping technique. In the long run, they set out to gather information on student learning techniques with the help of concept mapping. They intended to explore the efficiency of concept mapping as a learning technique, and its effectiveness as an assessment tool. By comparing concept maps drawn at the beginning and at the end of the learning process, Poveda and Oneca (2006) concluded that students created more correct propositions and more detailed concept maps by the end of the study. In Ahlberg and Vuokko's (2004) study, concept maps were drawn by 20 elementary school students during two periods, each lasting three years. They set out to find out the teachers' experiences during the study, the reliability of the concept mapping technique in the long term, its effect on learning, and how concept maps and gender differences can affect preschool performance. The two three-year periods encompassed 23 projects. The results revealed that students were able to create significantly more correct propositions by the end of the programme in both learning periods. In the first part of the study, the students' preschool performance did not affect their achievement in making concept maps. In contrast, the results of the second part of the study showed that preschool achievement had a significant effect on concept mapping. The explanation the researchers provided was that the most important goal of their programme was simply that students learned, used and developed their learning skills. Although it had a dramatic effect in each class, no significant differences could be detected concerning gender.

Halimi (2006) used concept maps to investigate novice translators' text processing skills. Translation is a complex process as it requires many skills, such as understanding written texts, finding the main ideas, expressing content in the second language, problem solving, decision making in various situations and recalling information. Halimi (2006) investigated whether concept maps help students comprehend texts, and whether they could easily notice and recall the main ideas and grasp text cohesion. Students were divided into two groups. The experimental group was introduced to concept maps as tools of text analysis. Then, participants had the possibility to practise following instructions such as 'select the main ideas from the text', 'connect these ideas to others'. In the meantime, the other group analysed texts using traditional text analysis techniques. In the second part of the study the roles of the two groups were transposed. At the end of the study the students in the

experimental group were requested to do free recalling on the texts, write down what they could remember and then answer open-ended questions. According to the results, concept maps facilitated the work of students. In conclusion, the group which was first introduced to the concept mapping achieved better results. Halimi (2006) drew our attention to the role of practice; 20 hours of practice sessions per month proved to be too short a time for students to become familiar with the technique of concept mapping.

Vakilifard and Armand (2006) combined the activation of text comprehension and prior knowledge in their study. They introduced concept maps to foreign language students. 18 students took part in the study, 9 students were placed the experimental group and 9 in the control group. The students in the experimental group took part in a four-session training course. At the beginning the group got a concept map in which nodes and linking phrases from a given list were to be completed. This exercise sought to activate prior knowledge. Later, students were provided with a text. After having read it, students had the possibility of studying the given map and making changes based on their own opinions. During the study more and more parts of the concept maps, which were required to be reconstructed, were modified by the students. Before reading the text, the control group was given a multiple-choice test to fill out. This activity was followed by reading the given text, and on the basis of this students could correct their previous answers based on prior knowledge. At the end of the study, the results of text comprehension were analysed in both groups. In one of the exercises it was expected that students would find the answer in the text, while in the other exercise, connections and relationships between concepts within the text had to be found and understood. The students' performance in the experimental group turned out to be better than that in the control group. The experimental group was given questions at the end of the study to find out whether concept mapping had been helpful for them. Almost all the participants reported that they found concept maps useful for exploring the text structure, finding the key ideas and establishing the relationship between them and organizing information.

Recently, IT solutions in concept map research have gained growing popularity besides paper-pencil tests. More concept map software packages are available commercially[1]. Reader and Hammond (1994) requested students to create concept maps on PCs. The students' working process and the alterations they made in a new window were recorded during the practical sessions. The organization of concepts, the place of concepts, the system of grouping and the working process were all analysed. Students who connected all the concepts achieved the lowest scores. In this case, the students tried to summarize the ideas in a single figure regardless of their meaning. At the end of the programme, the researchers found that concept maps help students to organize their knowledge and to integrate new information in a meaningful way. They concluded that the learning of a text with a computer is more beneficial if students draw concept maps as opposed to taking standard notes.

Applying concept maps frequently plays a central role in collaborative learning. Immonen-Orpana and Ahlberg (2010) used this technique with physiotherapy students. Nine out of 22 potential participants were selected to participate in their study. Thus, the training group was composed of only nine students, out of which 3 students were high achieving, 3 students belonged to average achieving students and 3 students were low achieving students. A potential reason for the small size of sample might have been that researchers aimed at a more detailed analysis of thinking processes. Besides heuristics, concept mapping was used for evaluating the learning process. The main focus was placed on the analysis of reflective metacognitive competence development. The study analysed concept maps

1 e.g. http://vue.uit.tufts.edu/, http://inspiration.com, http://cmap.ihmc.us/

constructed during individual and collaborative work and examined the collaborative processes occurring during learning. The results showed that in the first two cases the differences between the individually created concept maps were very small, whereas considerable improvements were registered following shared collaborative learning. It was also observed that the atmosphere was very supportive and students communicated more compared to learning situations relying on traditional methods.

Concept maps also appeared in teacher training colleges. Zanting, Verloop and Vermut (2003) asked students to use this technique to analyse and assess the practical knowledge of the mentor teachers. The researchers interpreted practical knowledge as complex knowledge that is related to teaching experience, integrates content knowledge and is related to students and the teaching situation. Zanting, Verloop and Vermut (2003) provided a reason for studying practical knowledge from the viewpoint of mentor teachers. By observing them, teachers can profit from their own responses and explanations of their teaching. Describing our own ideas and knowing how to formulate assumptions gives an opportunity to reflect on our own activities. For future teachers, this is helpful because this way they can gain access to undocumented knowledge. Zanting, Verloop and Vermut (2003) showed how students could relate practice to theory and form their own opinions about teaching. The researchers were also interested in the students' opinions regarding concept mapping. They used data gathered in interviews to assess the practical knowledge of mentor teachers. They found that over 70% of the students considered concept maps useful to a greater or lesser degree. One benefit they mentioned was that concept mapping helped them to study different opinions and ideas. Furthermore, it helped teachers to reconsider their own views. Some of the problems participants faced were that concept mapping did not reveal any new information and it was too artificial and abstract for them. In contrast, concept mapping was useful for mentor teachers because it helped them to clarify their ideas and gave them the opportunity to analyse their own behaviour. The construction of concept maps occurred spontaneously and helped them to analyse new experiences. On the whole, concept maps were more analytical and descriptive than the interviews. In the following section, we present the results of our study related to concept mapping, based on text comprehension and the understanding of definitions.

Aims and research questions

Ausubel's theory (1968) served as the theoretical background for this study. In addition, the technique proposed by Novak (1990, 1998) and Novak and Gowin (1984) was applied in the construction of a concept mapping intervention programme. Here we seek to improve the students' comprehension of rules by means of concept mapping. The main aims are that students should learn to find the main concepts in a text, discover the relationships within the text, and ultimately, learn to draw concept maps unaided. We set out to discover the effect of the concept mapping training programme in Hungarian grammar and examine whether there are significant differences between the results of the experimental and control group.

Our hypotheses were the following:

a) We expected to find significant differences between the performance of the experimental and the control group and we predicted that the experimental group would perform better at the posttest.

b) As far as the types of concept mapping exercises are concerned, we expected to find significantly higher scores in the posttest when we compared the performance of the experimental group both on the pretest and posttest.

c) We expected that students would perform significantly better in completing exercises. We presumed that these types of exercises required only a superficial understanding and more instructions.

d) We expected that the variables of the chosen background tests would explain the tasks of concept mapping to a great extent. We hypothesized that the technique of concept mapping would have a positive influence on learning strategies, learning styles, attitude and school marks in different subjects.

Methods

Samples

The present study was carried out from October to February 2007 and was part of a large-scale project on concept mapping with more than 200 participants. The random sample consisted of 10 and 13-year-old students. 10-year-old students are 4th graders and 13-year-old students are 7th graders in Hungary. The participant classes were selected from partner schools of the Research Group on the Development of Competencies from the University of Szeged, which took part in a large-scale project (other studies involved were e. g. Antal, 2009; Molnár, 2009). The classes chosen included more low-achieving and disadvantaged students. The participants were divided into an experimental group and a control group. In the study 61 10-year-old and 69 13-year-old students were included in the experimental group and 62 10-year-old and 55 13-year-old students formed the control group. The research design was complex since teachers used different course books and workbooks in different schools. There are three versions of learning materials in use in these schools by three different editors, each of which has a different content and structure.

Instruments and procedures

While the pretest was based on students' prior knowledge, the posttest included the topics of the concept mapping exercises. The subjects used for the intervention material were included in the National Curriculum. The learning material was developed for 4th and 7th grade students. Our study consisted of 25 sessions by 10-year-old students and 31 sessions by 13-year-old students. In the study, each exercise was constructed by the teachers of the given subject. The research procedure was constructed to serve the aims of the developmental programme by promoting meaningful learning.

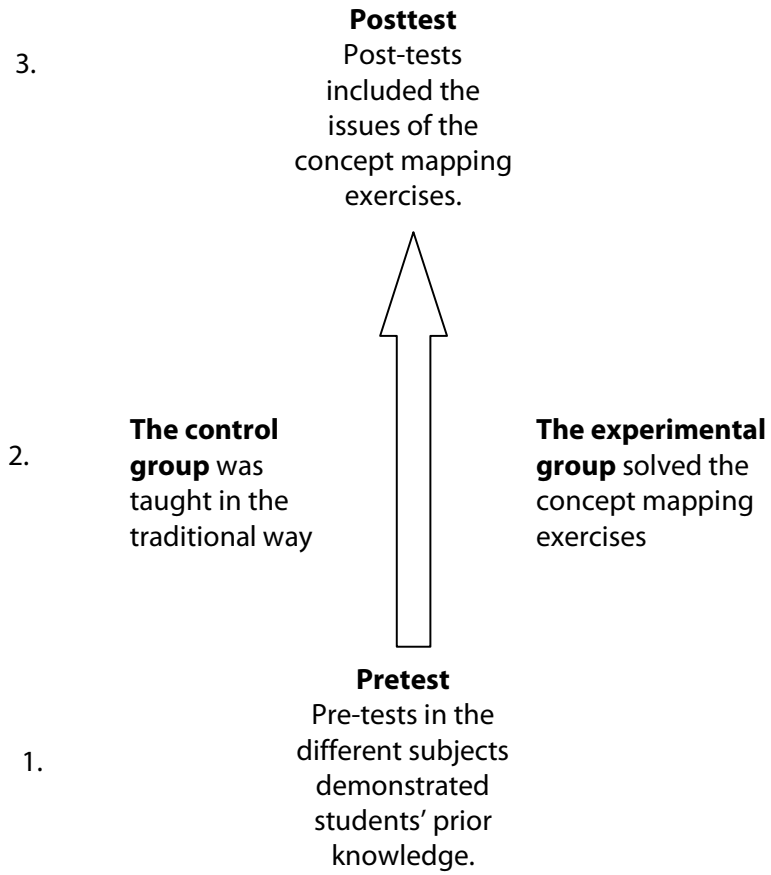


Figure 2. Research design.

The students worked on the given exercises, one per lesson, during the lessons. For the completion of each exercise, a time of five to ten minutes was allotted. Each student was provided with a workbook containing the exercises. First, the students each had to read the text of the given exercise, then they had to follow instructions of the prompts in the workbook, and after they drew their own concept maps. After students had finished the exercise, they received feedback. The task types included: (1) completing a map by filling in the nodes and defining the linking words, and (2) constructing a map from scratch. Below, I provide two examples from the Hungarian grammar programme (Figure 3. and 4.).

Indefinite subject

It is used when we cannot or do not wish to specify what the predicate modifies. Indefinite pronouns and verbs in 3rd person plural can occur in this position.

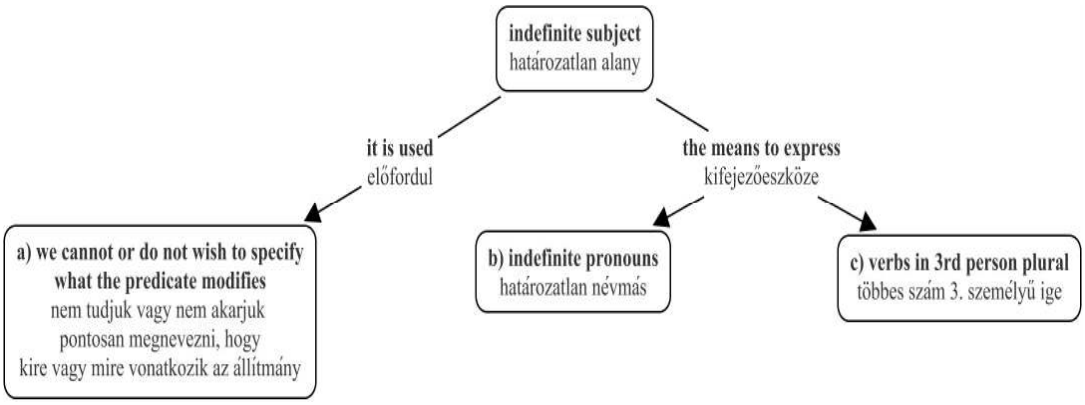


Figure 3. Sample task for 7th graders: Completing a map by filling in the nodes.

The object

The suffix "-t" is the formal marker of the object in the sentence. As regards word class, object position is generally occupied by a noun or a member of other word classes which can act as nouns like the question words "whom" and "what"

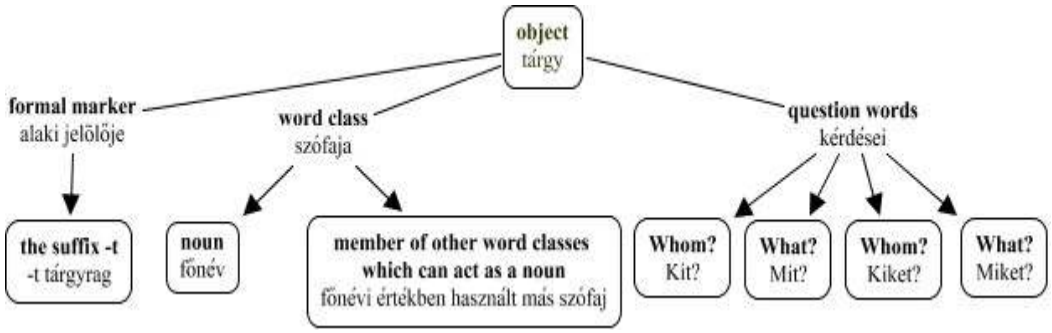


Figure 4. Sample task for 7th graders: Constructing a map.

The pretest was based on the students' prior knowledge in the different subjects, in line with the National Core Curriculum requirements. After completing the pretest, the experimental group was requested to participate in a series of concept mapping tasks, while the control group was taught in the traditional way. The posttest sought to examine the new knowledge acquired after the pretest. Pre- and posttests were constructed by teachers who were experts in their field. Both tests and concept mapping exercises were each corrected by one teacher.

4.3. Feedback for the students

First, the teachers were given a workbook that also included the completed maps, serving as sample maps and unified starting-points. The students were presented with the solution of the given map after having completed their own. After examining the workbooks, both teachers and students were given the possibility to raise relevant questions. Second, the students received their own workbooks without a key. These workbooks were used throughout the concept-mapping programme. Written instructions were provided in the workbook, which fostered individual work. After each exercise, feedback was given in

different forms. (1) The teacher and the students discussed the solutions of the mapping task; the students could also consult their own maps. (2) The teacher and the students discussed the solution without the help of the exercise books. (3) There was no feedback – the teacher did not give help until the exercise was completed. Having solved their tasks, the students could discuss them with the teacher.

Results

Tests

Students' knowledge was assessed at two different times. Their degree of knowledge was measured using a knowledge test at the beginning and the end of the programme. Cronbach's alpha was in most cases very high: 4th graders pretest: 0.95, posttest: 0.95; 7th grader pretest: 0.94, posttest: 0.95.

The tests contained different types of exercises. Recall, converting and recognition were assessed in the pretest of Hungarian grammar by 10-year-old students, while in the posttest recall and converting were assessed. As regards the tests of 13-year-old students, in the pretest recognition, implementation, recall, converting and interpretation were measured, while in the posttest recalling, recognition, implementation, and interpretation were in the focus.

Constructing the tests was quite a demanding task since teachers in the selected schools use different course books and workbooks. We had to take into account the potential differences in the learning material presented to various classes at a given time. Consequently, pretests in every subject were based on students' prior knowledge, which was common for every student. Posttests analysed the learning material presented with concept maps. This was necessary in order to be able to study the results of the experimental group and compare the results the two groups. During the construction of the posttest we also ensured that the learning material was familiar to both of groups. School teachers provided help in the process of the construction of these tests.

Results of the survey

Our study was carried out in the subject of Hungarian grammar. As stated in the first hypothesis, we assumed that we would find significant differences in the posttest and we presumed that the experimental group would achieve better results. Furthermore, we predicted that the experimental group would perform better when we compared the pre- and posttest results.

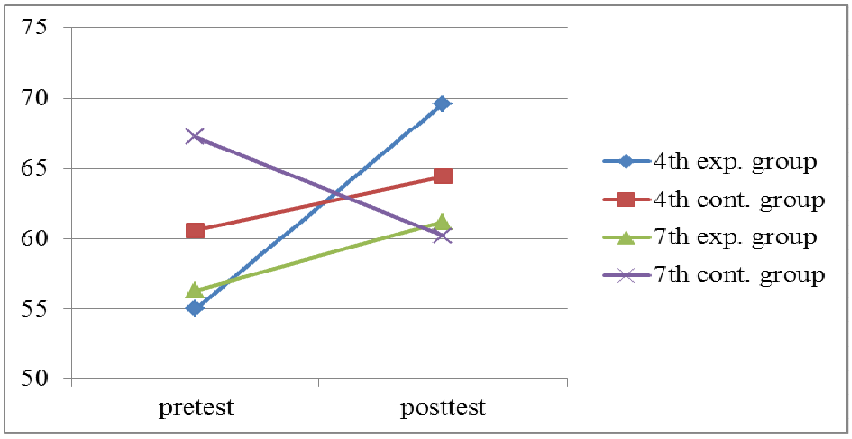


Figure 5. The results of the pre- and posttest (%p).

We did not discover significant differences between the experimental and control group in the 4th grade classes after comparing the pretest and posttest results. However, we found significant differences between the results of the two groups in the posttest, where the experimental group achieved better in the recall exercises (Mexp.gr.=77.5%p, Mcont.gr.=70.1%p; p <0.05). In addition, a significant difference was found in the performance of the experimental group for the pre- and posttest. Thus, our hypothesis that the experimental group would perform significantly better in the posttest was confirmed (Mexp.gr.=55.0%p, SDexp.gr.=18.2; Mcont.gr.=69.6%p, SDexp.gr.=16.7; p=0.001). The performance of the control group changed significantly as compared to the pre- and posttest results as well. They achievement also showed increase (3.8%p, t=3.304, p=0.001).

Regarding the results of 7th graders significant differences were found between the experimental and control group on the pretest. Here the experimental group performed less successfully in comparison with the control group (Mexp.gr.=56.3%p, SDexp.gr.=13.9; Mcont.gr.=67.2%p, SDexp.gr.=21.1). However, we did not find any significant differences after comparing the posttest results (Mexp.gr.= 61.2%p, SDexp.gr.= 14,6; Mcont.gr.= 60.2%p, SDexp.gr.= 23.3). It appears that the experimental group made up for their disadvantage. We investigated the differences between the pre- and posttest results of the two groups. On the one hand, a significant increase was found for the experimental group (t=-4.950, p=0.001), on the other hand we also observed a significant decrease in the achievement of the control group (t=4.135, p=0.001). Overall, the experimental group performed better in the posttest, which supports our first hypothesis.

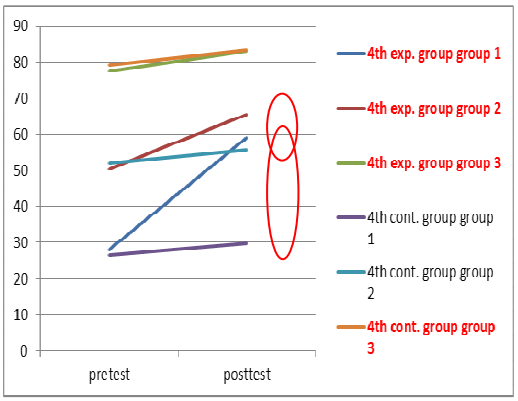
Students in the experimental and control group were placed into groups of three according to their results. The first group contained low-achieving students, the second group contained average ability students, while the third group included high-achieving students (Table 1.).

Table 1. The number of the groups.

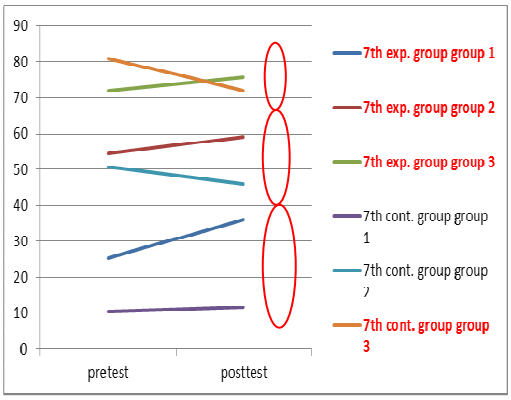
	4th grade experimental	4th grade control	7th grade experimental	7th grade control
group 1 (low-achieving)	8	7	6	3
group 2 (average)	36	29	46	18
group 3 (high-achieving)	17	26	17	34

One beneficial effect of the programme was that low-achieving students in the experimental group obtained significantly higher results in the posttest and we even observed a general improvement among them. In contrast, no changes could be detected in the achievement of the control group for group 1. However, group 3 showed a significant increase for 4th graders and a significant decrease for 7th graders. Our results suggested that the increase in the students' performance could be attributed to the programme. In most cases we found evidence that the low-achieving students in the experimental group performed better on the posttest, but at the same time we saw no significant change or decrease in the control group. Furthermore, we registered a significant increase for high-achieving students from the control group.

4th graders



7th graders



Figures 6-7. The results of the groups (%p) (significant differences are highlighted in bold and red p≤0.05).

By comparing results of the different groups in grade 4, we noticed a significant improvement in the posttest in two cases. Concerning the achievement of 7th graders, the low- and medium achievers showed a significant change in the posttest, furthermore, high-achieving students reduced their disadvantage and the differences were levelled (Figures 6-7.).

We analysed the effect of the programme and got extremely promising results (d4thgrade=0.63; d7thgrade=0.66), which encouraged us to further test the effectiveness of the concept map technique in other school subjects.

As stated in the third hypothesis, the two types of concept mapping exercises displayed significant differences. The 'completing a map by filling in the nodes and defining the linking words' type of exercises produced significantly higher results (M4thgraders=83.1%p; M7thgraders=76.1%p) in comparison with constructing a map (M4thgraders=64.2%p; M7thgraders=68.1%p). One possible explanation for this might be that these types of exercises only require a superficial understanding, while the creation of concept maps from scratch demands a deeper understanding and needs more organization. Gap filling exercises proved to be more successful, which may be partly due to the fact that more texts provided more input for students. It appears that it was easier for students to look for pieces of information in the text than to draw a concept map on their own. In order to draw a concept map from scratch, the ability to gather information and high level organization skills were required. Understanding was assessed on the basis of the layout and complexity of the concept map, which reflected their degree of comprehension of the given reading material.

Connections with other variables

We carried out a regression analysis using the two types of concept maps in each given subject as dependent variables and results from pre- and posttests, inductive thinking test, learning methods and learning strategies questionnaire, Hungarian grammar marks and attitudes as independent variables. In grade 4 we found that grammar pretest (34.5%) and learning activity (6.8%) explained almost than half of the completing exercises as dependent variable. One effect of constructing exercises as dependent variable could be seen in the grammar posttest (20.6%), while the other variables did not show any effect. Overall, we may reasonably conclude that applying the concept map technique in the classroom had a positive effect for this age group. In grade 7, the effect of the type of concept mapping exercise was more considerable in both cases, as with completing exercises as dependent

variables the type of exercise accounted for 38,2% of the results, and with constructing exercises as dependent variables it accounted for 52.2% of the results. A weaker effect of the grammar posttest (27.2%) could be seen among the independent variables in the completing exercises. The completing exercises had the largest effect and accounted for the results of construction exercises.

In summary, it may be concluded that based on our preliminary expectations, different types of concept map exercises had a clearly measurable effect on each other. Moreover, we also noticed a beneficial effect in the knowledge tests.

Conclusions

Visual organizational tools can be applied in different ways in schools. They provide numerous opportunities to draw attention to various connections. They are mostly used for acquiring content knowledge. However, following the stage of acquisition of knowledge, self-regulated learning plays an important role in organizing newly acquired knowledge.

In the concept-mapping programme, alongside with being asked to complete the exercises, students were introduced to a new learning strategy. They were more successful with 'completing the maps by filling in the nodes' exercises associated with a superficial understanding than they were with 'constructing a map' exercises. These exercises enabled students to work independently and organize information by themselves.

The aim of our programme was to provide students with skills that would allow them to map a text and understand it thoroughly. We had favourable results among the students, consequently we claim that low-achieving students also profited from the programme. The concept mapping technique can definitely have a beneficial effect in the classroom and on student achievement. However, its effect depends on the student's abilities. In the present study, it had a positive effect on low-achieving students in Hungarian grammar. The results suggest that success in the use of concept maps could be increased by tailoring the use of concept maps to students' individual needs. Unfortunately, acquiring and applying the technique of concept mapping in different fields is rather time-consuming. Consequently, this technique should be applied on a longer time-scale and within a wider range of subjects in order to make the differences more apparent. Further studies are currently being carried out based on these experiences from the first stage. In addition, research is extended to new areas for example science subjects. The PISA 2000 study found that Hungarian students apply rote-learning strategies far too often. Unfortunately, a long-term plan is required to change these habits. Not only students, but also teachers will need additional support, learning material and practical demonstrations to use new techniques. However, as this study shows, the benefits of applying concept maps in the classroom are evident.

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Student Academic Performance Outcomes of a Classroom Physical Activity Intervention: A Pilot Study

Heather ERWIN *
University of Kentucky, USA

Alicia FEDEWA
University of Kentucky, USA

Soyeon AHN
University of Miami, USA

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Abstract

A Physical activity is beneficial to children's health, yet academic pressures limit opportunities for students throughout the school day. The purpose of this study was to determine the effect of a classroom PA intervention on student academic performance outcomes. Intervention participants (n=15) received daily PA breaks. Reading and mathematics fluency, PA, grades, and standardized test scores were collected. Effects of the intervention were examined using mixed-design ANOVAs. Intervention students had significantly higher reading fluency and mathematics scores post-intervention and higher means for standardized reading and mathematics scores as well as grades. Short bouts of PA are important for improving CBM math and reading fluency scores. Classroom teachers should be encouraged to devote time during academic learning to incorporate PA.

Keywords: Curricular Intervention, Academic Achievement, Child Health, Curriculum-Based Measurement

Introduction

Throughout the last three decades, children have become increasingly more sedentary given the changes in our modernized environment (Centers for Disease Control and Prevention [CDC], 2009; Stevens, To, Stevenson & Lochbaum, 2008). Schools have been identified as locations in which physical activity (PA) promotion should occur (Pate, Davis, Robinson, Stone, McKenzie & Young, 2006). *No Child Left Behind* legislation has led to budget cuts and increased pressure for schools to increase standardized test scores, thereby leaving schools

* Heather Erwin, University of Kentucky, 115 Seaton Bldg. Lexington, Kentucky, USA 40506-0219, Phone: 859.257.5311 FAX: 859.323.1090 E-mail: heather.erwin@uky.edu

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to reduce or even eliminate programs that could enhance PA in children (Chomitz, Slining, McGowan, Mitchell, Dawson & Hacker, 2009; Coe, Pivarnik, Womack, Reeves & Malina, 2006; Sibley & Etnier, 2003). During school hours, the decrease of PA through limited time spent in physical education class or recess breaks contributes to the significant increase of sedentary behaviors in children. Fewer children walk or ride their bicycles to school, and PA is increasingly being replaced with television watching, time spent on the Internet, and the ubiquitous playing of video games (CDC, 2009; Stevens et al., 2008; World Health Organization [WHO], 2009). Experts recommend that children engage in 60 minutes or more of moderate to vigorous PA per day (Strong, Malina, Blimkie, Daniels, Dishman, Gutin…Trudeau, 2005), yet studies have found that only 42% of children ages 6-11 years obtain this goal (Troiano, Berrigan, Dodd, Masse, Tilert & McDowell, 2008).

When addressing health outcomes, typically the physical benefits are discussed; however, participating in physical activities has also shown a significant and positive effect on children's cognitive functioning (Fedewa & Ahn, 2011; Trudeau & Shephard, 2010) and academic outcomes, with no detrimental effects to learning when time is taken away from instruction (Sibley & Etnier, 2003). Researchers theorize that children receive cognitive benefits from participating in PA through a number of mediating processes (Basch, 2010; Trudeau & Shephard, 2010). In a review of the literature, Trudeau and Shephard (2010) identified physiological influences such as greater arousal and enhanced levels of neurotrophins that stimulate neural connections in the hippocampus or learning center of children's brains. Further, additional psychosocial influences were also found in the literature, including an increased level of self-esteem and connectedness in schools, likely enhancing children's ability to learn (Trudeau & Shephard, 2010). Research attempting to identify the mediating relationships between children's levels of PA and cognitive outcomes are limited by methodology employed in most of the studies (see Fedewa & Ahn, 2011), and thus the specific causal pathways between PA and children's cognitions have yet to be identified.

To date, most of the research examining the academic and cognitive effects of children's PA has been measured through traditional, standardized tests or grades. Although helpful in assessing the long-term effects of PA interventions on children's cognitive outcomes, these traditional measures are not useful in assessing short-term gains or improvement as a result of the intervention (Bricker, Yovanoff, Capt & Allen, 2003; Pretti-Frontczak, 2002). Given that PA interventions are not typically implemented over long durations of time (i.e., greater than one academic year), it is likely that effects of these interventions may be missed due to the measurements used to assess academic or cognitive gains (see Macy, Bricker & Squires, 2005).

Curriculum-Based Measurements (CBMs)

One way of assessing academic gains over short periods of time is through the use of CBMs. CBMs are research-based assessments used in schools to ascertain student achievement on basic skills such as reading, math, writing, or spelling. In response to the limitations of traditional, standardized tests, CBMs were developed in the 1970s as a means of monitoring children's response to an intervention (see Reschly, Busch, Betts, Deno & Long, 2009). These measures are well known and utilized by many teachers, school psychologists and other school personnel, as they are sensitive to small growth over time, are inexpensive, and translate into targeted goals for student achievement (Macy et al., 2005; Reschly et al., 2009). In a recent meta-analysis, Reschly and colleagues (2009) were able to demonstrate the strong predictive validity (r = .67) of a particular type of CBM — oral reading fluency measures — on children's future reading achievement and high-stakes standardized assessments. The

cumulative evidence over the past three decades has been remarkable for these measures given the relatively minimal resources in terms of cost and administration time.

As pressures for high stakes testing increase and the time children spend engaged in PA decreases, considerable evidence is needed to demonstrate the effectiveness of classroom-based interventions that promote PA during the school day. Yet despite this need, there is a dearth of research assessing the effectiveness of classroom-based PA interventions on children's learning outcomes. These types of interventions have, however, been shown to significantly increase student PA levels and intensity in the classroom (Cardon, De Clercq, De Bourdeaudhuij & Breithecker, 2004; Erwin, Abel, Beighle & Beets, 2009; Erwin, Beighle, Morgan & Noland, 2011; Gibson, Smith, DuBose, Greene, Bailey, Williams…Donnelly, 2008; Liu, Hu, Ma, Cui, Pan, Chang, et al., 2007; Mahar, Murphy, Rowe, Golden, Shields & Raedeke, 2006; Stewart, Dennison, Kohl & Doyle, 2004), as well as result in enhanced health outcomes such as improved BMI (Liu et al., 2007), decreased back/neck pain (Cardon et al., 2004), increased bone strength (Macdonald, Kontulainen, Khan & McKay, 2007; Macdonald, Kontulainen, Beck, Khan & McKay, 2008), and noise reduction in the classroom. All of these positive outcomes result in an increased ability to concentrate (Norlander, Moas & Archer, 2005).

In the handful of studies assessing the impact of classroom-based PA on children's academic performance, a number of benefits have been found. In particular, students have improved their behaviors (Maeda & Randall, 2003; Mahar et al., 2006), concentration (Lowden, Powney, Davidson & James, 2001; Norlander et al., 2005), recognition and memory (Della Valle, Dunn, Dunn, Geisert, Sinatra & Zenhausern, 1986), and reading and mathematical skills (Fredericks, Kokot & Krog, 2006; Uhrich & Swalm, 2007) from physical activities performed in the classroom setting.

Embedded within the need to establish effective PA classroom interventions are measures that are sensitive to incremental changes in students' academic growth. CBMs will not only allow for progress monitoring but also assesses students on content in which they are being exposed through their instruction. By using measures that detect small changes in academic growth, it may be possible to more accurately detect whether PA is exerting a positive effect on children's rate of learning or ability to retain material. Thus, the purpose of the current pilot study was twofold. First, the study aimed to evaluate whether implementing curricular PA positively influenced children's reading and mathematics achievement. Second, the relationship of CBMs with other standardized measures and grades used in assessing children's reading and mathematics achievement will be measured in order to examine its potential for further use as an academic assessment tool in monitoring the effectiveness of PA interventions. Because CBMs have not been used before as a tool for measuring the impact of curricular PA on children's academic outcomes, the present study serves as a pilot in investigating these questions.

Methods

Participants

Participants included 29 3rd grade students (M_{age} = 8.87, *SD* = .54) from one Southeastern elementary school (two classrooms). Students were assigned to intervention (*N* = 16) and control (*N* = 13) conditions via a quasi-experimental design (by homeroom class) over a 20-week intervention period. One classroom served as the treatment, while another classroom served as the control. Procedures were approved by the lead author's Institutional Review Board, and all parents/guardians signed an informed consent form, while all child participants completed an assent form to participate.

Instrument

Measurements of reading fluency, mathematics aptitude, grades, standardized test scores, classroom behavior, and school day PA were collected for all participants.

Two CBMs.Reading and mathematics fluency. Specifically, curriculum-based reading fluency and mathematics measures are short progress measures designed to assess children's reading and mathematical fluency (Stecker & Lembke, 2005). Criterion validity coefficients for curriculum-based measurements are .80-.90 for reading and .between .60-.80 for mathematics (Foegen, Jiban & Deno, 2007; Jitendra, Sczesniak & Deatline-Buchman, 2005). The oral reading fluency measures consisted of three reading passages wherein the child would read aloud for one minute, with the examiner recording the number of words correctly read for each passage. The median score out of the three reading passages was used for the child's oral reading fluency score at each of the three time points. For mathematical fluency, grade-appropriate mathematical problems consisting of addition, subtraction, and basic multiplication were given on a classwide level to the students every two weeks. The students were given one minute to complete as many problems as they could with the number of correct responses used as their mathematical fluency score for each of the three time points. The psychometric properties of these instruments are described in the results section.

Grades. Each classroom teacher also provided student grades for reading and mathematics at each of the three designated time points throughout the school year (December 2009, March 2010, May 2010). These were recorded as percentages (out of 100).

Standardized test scores. A number of different standardized tests were administered at different points throughout the school year. At the beginning and end of the school year, students took the Test of Primary Reading Outcomes (T-PRO), which assesses phonics, vocabulary, comprehension, and research skills, as well as Standardized Testing and Reporting (STAR) Reading tests (r=0.93; http://www.cde.ca.gov/ta/tg/sr/technicalrpts.asp), which coincide with the Accelerated Reader program. At three time points (August 2009, December 2009, and March 2010), the students completed the Discovery Education Assessment which assesses reading/language arts and mathematics. The outputs rate the students at levels, which are determined by the number of correct responses. These levels were recorded as: novice = 1, apprentice = 2, proficient = 3, and distinguished = 4.

Physical activity. To measure school day PA, participants wore a pedometer (Walk4Life, LS 2500, Plainfield, IL) for five consecutive school days, which is consistent with recommendations of monitoring periods for this age of children (Vincent & Pangrazi, 2002). This pedometer brand and model has been found to produce reliable and valid scores when used with children (Beets, Patton & Edwards, 2005).

Procedures

Curriculum-based reading and mathematics fluency. During the baseline week (September, 2010), trained researchers administered the reading fluency probes and each classroom teacher administered the mathematics assessments for all students. The same procedures were followed once every two weeks using different forms (alternate passages and worksheets validated for the purposes of alternate use) of the reading and math standardized assessments designed to measure small progress over time (Stecker & Lembke, 2005).

Physical activity. To prevent reactivity with the pedometers, participants were given the opportunity to handle the pedometer, open it, and practice applying and removing it from their waistband prior to data collection. On the first day of data collection, each participant

was assigned a pedometer to be used for the duration of the study. Upon entering the classroom first thing in the morning, students were instructed to wear the pedometer on their waistband for the entire school day. Immediately prior to dismissal, students returned their pedometer to the assigned bin. Their data were recorded on a data sheet and reset for use the next day. This occurred during five days of baseline and one random day per week during the intervention.

The classroom teacher of the intervention group led PA breaks for 20+ minutes per day. She maintained a log of all PA breaks she provided including the name and nature of the PA break as well as the duration and time period. Each integrated PA break related to the math and reading content that was currently being taught. She participated in a 30-minute classroom PA training provided by an expert in classroom-based PA. The training took place prior to baseline data collection. During the training, the definition of PA, the importance of PA in the classroom, and the connection between PA and academic performance were presented. Additionally, managing children in PA settings and instructional means for presenting activity breaks to the students were emphasized. The intervention teacher was provided with *Promoting Physical Activity and Health in the Classroom* activity break cards (Pangrazi, Beighle & Pangrazi, 2009) and other web resources for classroom physical activities (i.e., Energizers, PE Central). In addition to the training and resources, the year prior to implementation of the intervention, the intervention classroom teacher took two graduate courses related to PA promotion with youth and teaching effectiveness in PA settings. The courses each addressed classroom PA breaks.

The classroom teacher of the control group did not provide these PA breaks to her students. In lieu of the PA breaks, students in the control group continued with traditional, in-seat learning of the content. This included teacher-directed instruction, individual student seatwork, and partner or group work at desks. All students had the same amount of time allotted for physical education (two 30-minute classes per week) and recess (one 30-minute session per day).

Data Analysis

The validity of curriculum-based measurement (research question 1) was addressed by examining the extent to which a particular test (i.e., CBM) correlates with previously validated measures (i.e., standardized test scores and teacher-reported grades). Therefore, scores from CBM's, standardized test scores, and teacher reported grades were correlated and compared separately for reading and mathematics achievement. Of nine repeated CBM measures, only scores at baseline, time 5, and time 8—which were collected at the same time points as standardized test scores and teacher grades of mathematics and reading—were correlated with the other two measures such that differences in the number of repeated measures were controlled and further students' performance on different measures were compared concurrently.

Next, the intervention effects of PA on mathematical and reading performances (research question 2) were examined, using a series of mixed-design ANOVAs. To control for differences in the number of repeated scores, the authors chose three CBM scores at baseline, time 5, and time 8. Therefore, for reading and mathematics achievement, two sets of mixed-design ANOVA—using time and measures as within-subject factors and the type of intervention as a between-subject factor—were performed.

Results

Validity of Curriculum-Based Measurement

The concurrent validity of the curriculum-based measurement was evaluated based on inter-correlations among all three measures (i.e., CBM, standardized test scores, and teacher ratings of students' grades) on reading and mathematics, separately. Table 1 and Table 2 show correlations among scores from CBM, standardized test scores, and teachers' reported grades for the control group in the upper diagonal of the matrix and for the treatment group in the lower diagonal of the correlation matrix for mathematics and reading, respectively.

As shown in the shaded areas of Table 1, mathematics scores from CBM had small to large correlations with standardized test scores on mathematics for both control and intervention groups. However, the correlations between CBM scores and grades were small and insignificant. As shown in the shaded areas of Table 2, reading scores from CBM, standardized scores, and grades were correlated with a small to large magnitude. Patterns of correlations among three measures on reading were similar between intervention and control groups, showing lower correlations between CBM scores and grades, yet higher correlations between CBM scores and standardized test scores.

Intervention Effect on Mathematics Achievement

A preliminary analysis was first performed to determine whether any preexisting differences on mathematics scores existed between control and intervention groups. Results from three sets of independent t-tests showed that the intervention group was not statistically different from the control group on CBM scores ($t(27) = -.87$, $p = .39$), standardized test scores ($t(25) = -.24$, $p = .81$), or teacher's reporting of students' grades ($t(25)=-2.52$, $p = .05$), indicating no statistically significant pre-existing differences at the baseline measures of mathematics between the two groups.

Mauchly's tests indicated that the assumption of sphericity was violated for the main effects of measure, $\chi^2(2) = 10.94$, $p = .004$, and interaction effect between measure and time, $\chi^2(9) = 23.58$, $p = .005$, but not for the main effect of time ($\chi^2(2) = 2.43$, $p = .30$). Therefore, degrees of freedom were corrected using the Huynh-Feldt estimates of sphericity (Gamst, Myers & Guarino, 2008) for measure ($\varepsilon = .78$) and interaction between measure and time ($\varepsilon = .77$). As shown in Table 3, a mixed-design ANOVA showed that the main effects of time ($F(2, 44) =15.52$, $p < .01$, partial $\eta^2 = .41$), measures ($F(1.56, 34.36) = 2716.32$, $p < .01$, partial $\eta^2 =.99$), and intervention ($F(1, 22) = 7.49$, $p = .01$, partial $\eta^2 =.25$) were statistically significant. Further, two-way interactions between time and measure ($F(3.08, 67.84) = 8.67$, $p < .01$, partial $\eta^2 = .28$) and three-way interactions among time, measure, and intervention ($F(3.08, 67.84) = 6.49$, $p < .01$, partial $\eta^2 = .23$) were statistically significant.

Because a higher-order interaction supersedes lower-order effects (Gamst, Myers & Guarino, 2008), follow-up tests were performed to further investigate the three-way interaction among time, measure, and intervention in detail. Tests of simple effects showed a significant two-way interaction effect between time and intervention for CBM scores ($F(2,26) = 10.31$, $p <.01$), but not for standardized test scores ($F(2,21) = 2.63$, $p = .10$) or teachers' reported grades ($F(2,23) = 1.59$, $p = .23$) . As shown in Figure 1, the intervention group ($M = 24.56$, $SD = 2.21$) scored significantly higher on CBM scores than the control group ($M = 13.69$, $SD = 2.45$) at time 3 ($M_{diff} = 10.87$, $p = .003$), but not time 1 ($M_{diff} = 2.75$, $p = .39$) or time 2 ($M_{diff} = 2.16$, $p = .49$).

Table 1. *Correlations among CBM, Standardized Test Scores, and Grades on Mathematics*

Time3	Time2	Time1	Test: Time3	Test: Time2	Test: Time1	CBM: Time3	CBM: Time2	CBM: Time1	
.445	.386	.370	.741**	.646*	.544	.883**	.895**	1	CBM Time1
.235	.422	.306	.842**	.685*	.464	.753**	1	.359	CBM Time2
.379	.273	.130	.722**	.690*	.579*	1	.424	.843**	CBM Time3
.697**	.661*	.516	.561	.686*	1	.483	.311	.423	Test Time1
.488	.708**	.219	.851**	1	.782**	.548*	.526	.585*	Test Time2
.336	.498	.327	1	.402	.352	.280	.165	.581*	Test Time3
.647*	.508	1	-.277	.463	.002	.505	.019	.420	Grades Time1
.408	1	.070	.337	-.013	.582*	.107	-.254	.216	Grades Time2
1	.011	.670**	.067	.632*	.394	.666**	.167	.544*	Grades Time3

Note. ** $p < .01$; * $p < .05$

Table 2. *Correlations among CBM, Standardized Test Scores, and Grades on Reading*

Grades: Time3	Grades: Time2	Grades: Time1	Test: Time3	Test: Time2	Test: Time1	CBM: Time3	CBM: Time2	CBM: Time1	0
.445	.386	.370	.741**	.646*	.544	.883**	.895**	1	CBM Time1
.235	.422	.306	.842**	.685*	.464	.753**	1	.359	CBM Time2
.379	.273	.130	.722**	.690*	.579*	1	.424	.843**	CBM Time3
.697**	.661*	.516	.561	.686*	1	.483	.311	.423	Test Time1
.488	.708**	.219	.851**	1	.782**	.548*	.526	.585*	Test Time2
.336	.498	.327	1	.402	.352	.280	.165	.581*	Test Time3
.647*	.508	1	-.277	.463	.002	.505	.019	.420	Grades Time1
.408	1	.070	.337	-.013	.582*	.107	-.254	.216	Grades Time2
1	.011	.670**	.067	.632*	.394	.666**	.167	.544*	Grades Time3

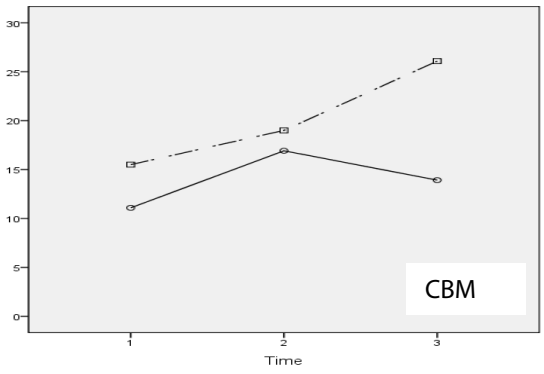
Note. ** $p < .01$; * $p < .05$

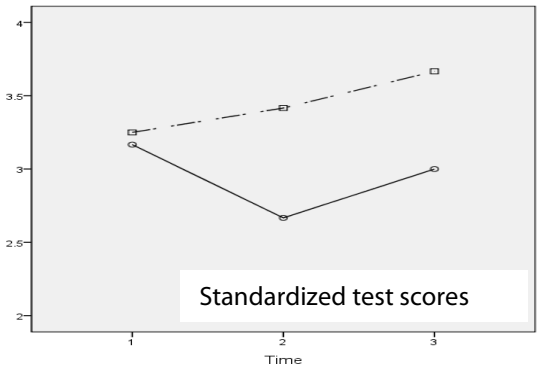
Table 3. *Results from Mixed-design ANOVA on Mathematics*

Source	*SS*	*df*	*MS*	*F*	*p*	Partial η^2
Time	563.18	2	281.59	15.52	<.01	.41
Time * Intervention	76.95	2	38.48	2.12	.13	.09
Error (Time)	798.31	44	18.14			

Table 3 (Continue). *Results from Mixed-design ANOVA on Mathematics*

Source	*SS*	*df*	*MS*	*F*	*p*	Partial η^2
Measure	330133.93	1.56	211367.38	2716.32	<.01	.99
Measure * Intervention	341.37	1.56	218.56	2.81	.09	.11
Error (Measure)	2673.81	34.36	77.81			
Time * Measure	432.63	3.08	140.30	8.67	<.01	.28
Time * Measure * Intervention	323.74	3.08	104.99	6.49	.<.01	.23
Error (Time * Measure)	1097.19	67.84	16.17			
Intervention	872.02	1	872.02	7.49	.01	0.25
Error	2562.85	22	116.49			





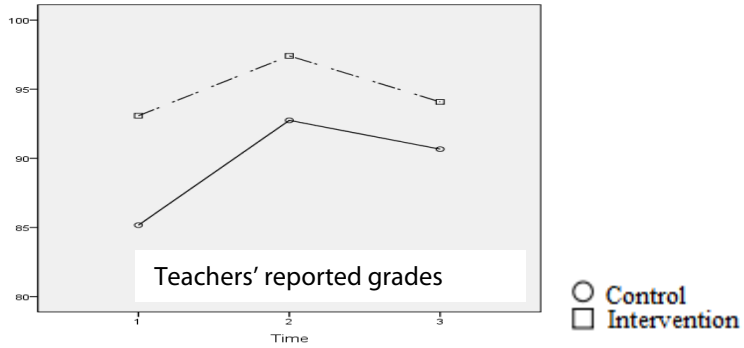


Figure 1. Mathematics across Time by Intervention Groups

Intervention Effect on Reading Achievement

Results from three sets of an independent t-test indicated no pre-existing differences between control and intervention groups on all three measures of reading achievement, $t(27) = -1.48$, $p = .15$ for the CBM scores, $t(26) = -.97$, $p = .34$ for standardized test scores, or $t(25) = -1.39$, $p = .18$ teacher's rating of students' grades.

Mauchly's tests indicated that the assumption of sphericity had been violated for the main effects of measure, $\chi^2(2) = 80.06$, $p < .01$, and interaction effect between measure and time, $\chi^2(9) = 48.35$, $p < .01$, but not for the main effect of time ($\chi^2(2) = .22$, $p = .90$). Therefore, degrees of freedom were corrected using the Huynh-Feldt estimates of sphericity (Gamst, Myers & Guarino, 2008) for both measure ($\varepsilon = .53$) and interaction between measure and time ($\varepsilon = .67$). A mixed-design ANOVA showed statistically significant main effects of time ($F(2, 40) = 14.39$, $p < .01$, partial $\eta^2 = .42$), intervention ($F(1, 22) = 353.51$, $p < .01$, partial $\eta^2 = .95$) and measures ($F(1.06, 21.23) = 95.27$, $p < .01$, partial $\eta^2 = .83$) as well as two-way interactions between time and measure, $F(2.67, 53.29) = 7.66$, $p < .01$, partial $\eta^2 = .28$.

The significant two-way interaction between time and measure was examined by testing the simple effects of measures at each time point. Pairwise comparisons using a Bonferroni adjustment indicated that the CBM scores were statistically higher than standardized test scores for all three time points ($M_{diff} = 79.46$, $p < .01$ for time 1; $M_{diff} = 87.41$, $p < .01$ for time 2; $M_{diff} = 92.46$, $p < .01$ for time 3). Similarly, students scored higher on standardized test scores than teachers' reported grades for all three time points ($M_{diff} = 88.50$, $p < .01$ for time 1; $M_{diff} = 90.73$, $p < .01$ for time 2; $M_{diff} = 91.91$, $p < .01$ for time 3). However, no differences were found between CBM scores and teachers' reported grades for any of the three time points.

Table 4. *Results from Mixed-design ANOVA on Reading*

Source	*SS*	*df*	*MS*	*F*	*p*	Partial η^2
Time	1015.12	2	507.56	14.39	<.01	.42
Time * Intervention	11.40	2	5.70	0.16	.85	.01
Error (Time)	1410.59	40	35.26			
Measure	344423.48	1.06	324414.61	95.27	.<.01	.83

Measure * Intervention	7829.28	1.06	7374.45	2.17	.16	.10
Error (Measure)	72308.34	21.23	3405.38			
Time * Measure	1015.48	2.66	381.11	7.66	<.01	.28
Time * Measure * Intervention	11.02	2.66	4.14	0.08	.96	.00
Error (Time * Measure)	2649.72	53.29	49.72			
Intervention	757396.55	1.00	757396.55	353.51	<.01	0.95
Error	5912.75	1.00	5912.75	2.76	.11	0.12

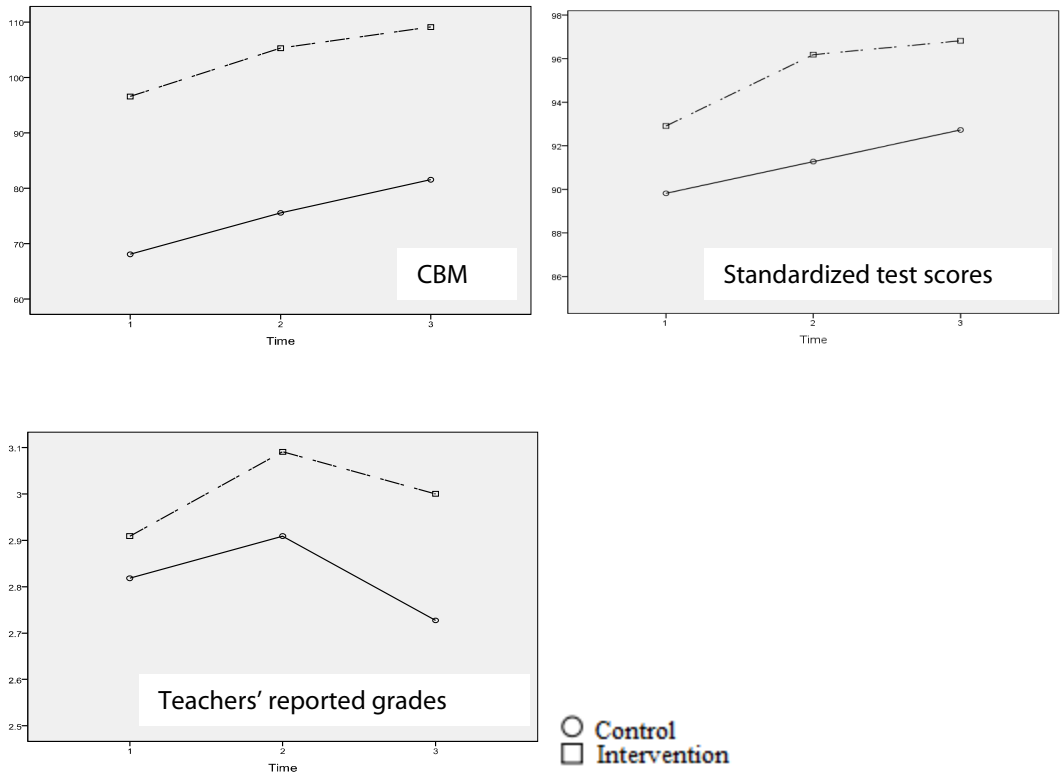


Figure 2. Reading across Time by Intervention Groups

Discussion

The present study sought to evaluate the potential effectiveness of implementing curricular PA on children's reading and mathematics achievement. Second, the authors examined the validity of curriculum-based measures with other standardized measures and grades in assessing children's reading and mathematics achievement. Each of these questions will be discussed with respect to the findings of the current study as well as implications for classroom teachers.

The results of the current study suggest that curricular PA had a significantly positive effect on children's CBM reading and mathematics scores. Given the short increments of time in which these measures were administered, it is likely that CBMs were better able to pick up

small increments of growth in children's achievement than were standardized test scores. The results of the additional PA on children's reading and mathematics scores that was implemented in the treatment group confirm the general body of research in this area, suggesting that PA may enhance children's cognitive outcomes (Fedewa & Ahn, 2011; Sibley & Etnier, 2003; Trudeau & Shephard, 2010).

When examining mathematics scores, in particular, CBM scores for the control group peaked at Time 2 and dropped at Time 3, whereas the intervention group continued to improve upon their outcomes. With regard to standardized test scores, both groups scored similarly at Time 1; the control group dropped at Time 2, and both groups improved at Time 3. Again, the intervention group showed a consistent trend of improvement. Teachers' reported grades showed a jump at Time 2 and a slight drop at Time 3 for both groups. These trends suggest that PA enhanced learning for those students in the intervention group.

For reading, students in both groups showed improvement from Time 1 to Time 3 on CBM scores and teachers' reported grades. Standardized test scores for reading peaked at Time 2 and dropped for both groups at Time 3; however, the control group demonstrated a greater drop in scores than the intervention group. Thus, the PA intervention appeared to be more beneficial for mathematics. One possible explanation is that the PA breaks may have been more geared towards mathematics content thus leading to greater improvements in that area.

The last hypothesis examined whether CBMs are valid measures of assessing students' achievement over time in comparison to standardized test scores and teacher grades. As mentioned earlier, although standardized test scores may be helpful in assessing the long-term effects of PA interventions on children's cognitive outcomes, these traditional measures are not useful in assessing short-term gains or improvement as a result of the intervention (Bricker et al., 2003; Pretti-Frontczak, 2002). In the vast majority of PA intervention research, durations of curricular interventions are not typically implemented for longer than one academic year, thus necessitating a measure that can capture small increments of achievement growth.

In the present study, it was hypothesized that CBMs would provide a more accurate indicator of student academic progress than standardized test scores given the short 20 week duration of the study. It was discovered that students in the treatment group had significantly higher scores in reading and mathematics when assessed by CBMs, but that this difference did not reach significance when compared by standardized test scores or teacher grades. Further, the reading and mathematics CBMs were moderately to largely correlated with the standardized test scores while teacher grades were not correlated with either CBM or standardized test scores. These are very promising findings, as the inclusion of CBM assessments in measuring the effects of curricular PA interventions should be strongly considered. CBM assessments are short, accurate, and reliable measures that have been used to assess student academic progress for over four decades (Reschly et al., 2009). Perhaps by using standardized test scores or teacher grades as indicators of student academic progress, the beneficial effects of PA interventions have been missed in the literature. The current study provides preliminary evidence for the benefits of using CBMs in measuring students' academic growth as a result of curricular PA interventions.

In conclusion, allotting 20+ minutes per day to provide curricular-based PA breaks to students does not appear to detract from student performance outcomes, behavior or PA levels. In fact, reading and math scores (as measured by CBMs) significantly improved, while PA levels showed a trend of increasing due to this type of intervention. Elementary teachers

should be encouraged to incorporate PA during their lessons in the classroom setting due to the multiple positive student outcomes.

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The Interpretive Strategies Utilized by Elementary Students with and without Learning Disabilities in Comprehending Poems

Georgette G. LEE*
University of Illinois, USA

Marie Tejero HUGHES
University of Illinois, USA

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Abstract

Poetry is a genre that supports all aspects of literacy, and it is the first to which most children are exposed through motherly lullabies. Yet, while many studies have been conducted on prose comprehension, there is little empirical research on poetry comprehension, and none published on the specific strategies elementary students with learning disabilities (LD) utilize in understanding poems. The purpose of this study is to examine the interpretive strategies used by students in comprehending poetry. Participants were 16 fifth and sixth grade students with LD and 16 of their typical peers, who individually listened to poems and answered questions about them. Students with LD effectively used as many interpretive operations as their peers, adopted an aesthetic stance to reading, and performed more like experts than novices. Furthermore, the difficulty of the poems did not appear to have affected the students' enjoyment of them.

Keywords: Poetry Comprehension, Learning Disabilities, Strategies

Introduction

The study of the classical poets in particular and of poetry in general has steadily declined over the years, and poetry lacks the prestige of other literary genres (Harris, 2008). Some literacy researchers have even down-played poetry, viewing poetry reading and writing as less fundamental to literacy development than stories (Dyson & Ganish, 1994), despite the many benefits that poetry is purported to offer. Poetry is a useful tool for enhancing all aspects of literacy: reading, writing, listening, and speaking. Early elementary school teachers use nursery rhymes to help in the development of phonemic awareness skills, one-to-one correspondence, and vocabulary, while repeated poetry read-alouds help to produce fluent

* Georgette G. Lee, University of Illinois, 133 Lake Hill Drive, Steger, IL 60475 USA, Phone: 708-754-4205 (H); 708-224-7806, E-mail: glee24@uic.edu

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and expressive readers (Gasparro & Falleta, 1994; Manning, 2003). Poetry instruction has helped third graders who were struggling readers with their fluency, building conceptual understanding, their attention to the reading process (Sekeres & Gregg, 2007), and word recognition and confidence (Wilfong, 2008). Regarding poetry writing, Kucan (2007) found that having fourth graders write poetic responses ("I" poems) about people and places encountered in stories deepened their literary understanding of the characters, plot, conflict, and narrative point of view. Along with these benefits, there is an abundance of literature available on how to teach poetry in elementary schools (e.g., Certo, 2004; Lenz, 1992; Linaberger, 2004), yet, there is nothing on the poetry comprehension of students with Learning Disabilities (LD).

Poetry Comprehension

An early study by Harris (1948) identified translating, summarizing, inferring tone, mood, and intent, and relating technique and knowledge as four operations necessary for literary text comprehension (inclusive of poetry). Translating may be viewed as a reader's attempt to derive meaning from a text through the understanding of words and phrases, idioms, figurative language, and structural elements. The theory of 'defamiliarization' (Miall & Kuiken, 1994) represents a kind of translating process, where literary stylistic devices such as metaphor forces the reader to move away from the familiar word meaning to generate a personal meaning. Closely related to translating is summarizing, which entails grasping the main idea of the poem. Readers may summarize the poem's subject or characteristics of its persona. In inferring tone, mood, and intent, the reader makes inferences about the poet's attitude toward the subject matter, his or her emotions, and purpose for writing the poem. The final strategy outlined by Harris (1948) as necessary for interpreting a literary text like poetry is relating structure and meaning. The reader takes into account the poet's use of rhyme, line structure, figurative devices and such elements to derive the deeper meaning of the text. This exceeds the plain sense interpretation of the poem. Poetry readers must adopt an aesthetic stance, by paying more attention to style and how it affects their understanding to fully comprehend a poem.

Other more recent studies which examined poetry comprehension specifically utilized participants who were of high school age and beyond. One such example, a landmark study on how experts construct meaning when reading poetry, was conducted by Peskin (1998). She utilized an expert-novice Think-Aloud (TA) format with 8 expert English PhD candidates, and 8 relative novices who were either second-year English undergraduates, or high school students in their final two years in a school with in-depth poetry instruction. Participants read and responded to two period poems. The experts used significantly more structural cues (binary oppositions, rhythm, and word play and language) than novices to help in understanding the poems. Even when novices recognized the binary oppositions in one of the poems, they dismissed them as confusing, instead of looking for the poem's meaning in the nucleus of the seemingly contradictions. These findings were supported by Braun (2003), who, in a similar expert-novice study, examined both cognitive and affective processes involved in poetry comprehension. Participants were 12 English literature undergraduates (novice group), and 12 English literature graduate students (expert group), who responded to one intellectual and one emotional poem, in a TA condition. Experts had a text-reader orientation, which was typified by more metacognitive comments, an attention to style of text (especially sound, rhythm, and structure), and embodied reflection. Novices, on the other hand, were more text oriented in their approach to meaning making. They looked solely to the text for emerging meaning, and unsure of what exactly to look for in the text, they were drawn to things that were perceived as being different from what they expected

(Braun, 2003). In addition to these cognitive experiences, affective experiences also accompany the task of interpreting and comprehending a poetic text.

Eva-Wood (2004) explored the role of affect in poetry comprehension. Students trained in a think and feel aloud method were better able to identify stylistic devices, analyze themes, and recognize figurative language than those trained in a think aloud method alone. Furthermore, a poem's difficulty may diminish the reader's interest. As Peskin (1993) demonstrated, experts were more inclined to express an interest in poems than novices. The problems novices faced in constructing meaning prompted them to express frustration with difficult poems. Other affective strategies were identified as helping high school students to understand poems (Eva-Wood, 2008). These students examined the emotional connotation of words in identifying the poem's mood, and engaging in and interpreting its figurative language. Sensory-based responses like visualization served to expand the interpretation of imagery and to foster a visceral experience of the poem's tastes and textures. In identifying with the speaker, students drew on "empathetic understanding" that allowed them to enter imaginatively into the perspective of another. Based on the studies reviewed, successful engagement with the poetry genre necessitates deliberate attention to both cognitive and affective processes.

Poetry remains an understudied topic in empirical research, especially at the elementary level, and with students with LD. Given the lack of research focusing on poetry comprehension for elementary students, the purpose of the current research is to examine and describe the interpretive strategies used by fifth and sixth grade students with and without LD while interacting with poetry. These specific strategies have been previously identified as being pertinent to literary text comprehension (e.g., Gersten, et al., 2001; NRP, 2000; Oakhill & Cain, 2000). The research aims to fill a gap in the literature by supplying information about the types of strategies used by elementary-aged students with and without LD in comprehending poetry. The study seeks to answer the following: (1) What interpretive strategies are upper elementary students with and without LD making use of in comprehending poems? (2) How does the use of the interpretive strategies of students with LD compare and contrast with that of their typical peers? (3) Is students' enjoyment of poetry influenced by the poem's complexity and the difficulty they may experience while attempting to comprehend the poem?

Methods

Participants

The research was conducted in three randomly selected elementary schools from one public school district in a large Midwestern state. The suburban district serves primarily African American (91.9%), Hispanic (3.7%) and Asian (3.4%) students coming largely from low-income households, with approximately 96% of students receiving free or reduced-cost lunch. Approximately 4% of the students in the elementary schools from this district have been identified as having a LD. The combined population of students with LD in grades 5 and 6 of the three schools was 18; of which 17 (94%) returned parental forms, but one withheld consent, leaving 16 eligible students who formed the students with LD group. AA students are the corresponding number of students from the general education classes in grades five and six performing in the mid range for these schools based on grade equivalent (GE) scores on the STAR Reading test, a computer-based test that determines the reading level of students, and measures their individual and collective growth. Thus, average STAR reading scores of the grades 5 and 6 students were calculated and a 1.6 year range was established. Students then were eligible if their STAR reading GE scores were between a range of 3.5 – 5.1 for grade 5, and 4.5 – 6.1 for grade 6. Students were matched by grade,

gender and ethnicity, and if more than one person met the 'match' criteria, the one with the higher STAR Reading GE score was selected. Thirty-two students participated, half of whom were students with LD (see Table 1). Note that all participants, though housed in separate home rooms, received their grade-level reading and language arts instruction together in inclusive settings.

Table 1. *Demographic Characteristics of Research Group*

	Group			
	LD			AA
	N=16			N=16
Gender				
Male	9			9
Female	7			7
Ethnicity				
African American	12			12
Hispanic	4			4
	M	SD	M	SD
Grade	Age in years			
5	11	0.8	11	1.0
6	11	0.8	12	0.5
STAR Reading GE	2.6	1.8	4.8	0.8
Verbal IQ	85	3.7		

Materials

Poems. Two poems were selected for the research study, "Stopping by Woods on a Snowy Evening (Frost, 2004), and "October Saturday" (Katz, 1990). The first poem is a traditional one, and the other, a more contemporary verse, based on the following criteria: (a) they were difficult enough to encourage careful thought, but not to discourage accessibility of weaker comprehenders, (b) they were unlikely to have been read by the students, and (c) they exemplified some figurative device (e.g., metaphor, simile). (See Table 2 for a Compare/Contrast Chart of the poems). To reduce the effect of readability on comprehension, the researcher personally taped-recorded and played the poems, while students followed along on individual copies. This introduced a read-aloud format, while allowing students to follow along on their scripts, and to "look back" at the text to assist with answering questions.

Table 2. *Compare/Contrast Chart of Poems*

Stopping by Woods on a Snowy Evening	Similarities	October Saturday
Traditional		Contemporary
20th century		21st century
About winter	Describe a season Set outdoors Use of vivid imagery	About fall
4 lines each stanza	4 Stanzas	Varied-length stanzas
End Rhymes: aaba scheme		Free-verse; one end rhyming pair
Uniformed sentence length		Varied sentence length

Table 2 (Continue). *Compare/Contrast Chart of Poems*

Inverted sentence structure Archaic nouns	Repeated words and lines for emphasis	Common sentence structure Familiar nouns
Hyperbole, alliteration repetition, synecdoche	Figurative devices:	Hyperbole, onomatopoeia, personification, metaphor
Title directly reflects content		Title may lead to various predictions of content
Vocabulary, concepts, syntax	Possible Challenges	Metaphor/Extended Metaphor

Instruments

Comprehension Prompt. Geared at assessing 10 predetermined interpretive strategies, 12 questions for each poem were generated by the researcher. Prior to using the prompts with the students, the poems and questions were given to 10 expert readers (middle and high school English teachers) who read the poems, wrote answers, and suggested rephrasing of questions for clarity. This level of teachers was chosen as English experts who were more likely to be specialists in the area of literature than elementary teachers. After examination of the experts' answers and suggestions regarding the wording of questions, slight modifications were made. A second reliability and validity check was conducted with 10 middle school students, half of whom were identified with LD. Students listened to the taped recorded poems and then wrote answers to the questions. This helped to shed light on possible difficulties that might be encountered in answering the questions by the research participants, and the time-frame of the interactive poetry session.

Interview. At the start of the initial poetry session, and prior to reading the poem, students were asked four questions to reduce any anxiety and to set a friendly, comfortable atmosphere. These questions also solicited pertinent information about the students' general attitude toward poetry. The questions are: What types of things do you like to read about? Do you like poetry? Do you know any poems by heart? (If yes, please recite the poem); and Do you know the names of any poets? (If yes, please name them).

Procedures

During the latter part of the fall semester, the two poems were presented to the students on separate days. To control order effect, the presentation of poems was counterbalanced between students, so that half of the students received the traditional poem first. Students were pulled out from their class individually by assigned number for about 20 minutes per session. The researcher did not know at the time of the session if the student had a learning disability or not. For the first session, the researcher began with an interview that contained a few general questions. Students were read the title of the poem and the name of the poet by the researcher, and were asked to make a prediction. After, they were provided with a copy of the poem and told to listen to the recorded poem and to follow along on their individual copies without interrupting. Following the first reading, the researcher asked the students if they had read the poem before to ascertain any prior knowledge. Students were told to listen for the second reading, and encouraged to interrupt to make comments or to ask questions. This was followed by the questioning session. All proceedings were audio taped.

Data Analysis

Discourse analysis. The term discourse analysis, refers to a number of varying qualitative approaches researchers use to investigate written or spoken discourse. Such approaches have been developed to study ways in which knowledge is socially fashioned in diverse classrooms and other educational settings (Gee & Green, 1997). Research in reading has utilized discourse analysis as an approach to investigate specific mental operations or processes mirrored in the oral and written discourse of participants (e.g., Eva-Wood, 2004, 2008; Janssen, Braaksma & Rijaarsdam, 2006). Here, the major theoretical assumption is that these mental realities are constructs of language, and reflect any underpinning processes that produced the specific utterance. It was further assumed that, since the questions targeted specific strategies, student answers would reflect their use or non-use of those strategies. Data were analyzed using open coding procedures (Strauss & Corbin, 1990). The students' use of interpretive strategies was captured by qualifying the important aspects of their verbal responses as categories of the poetry comprehension process. While the questions largely determined the categories that were identified, specific subcategories were developed based on student responses. For example, student responses to the meaning of the poems identified four main subcategories: surface meaning, inference about topic, limited generalization about topic, and a broader generalization about life. Categories were developed through a three-tiered process of open, axial, and selective coding. In the open coding, through inductive and deductive processes, certain hypotheses were proposed from previous research and the experts' pilot data, and constantly checked against the student data to come up with broad initial categories and subcategories. During axial coding, in an ongoing interaction with the data, these categories and subcategories were then organized and combined. Finally, in the selective coding, broad conceptual categories were selected.

Reliability of the coding of the data was established according to the parallel criteria of Guba and Lincoln (1989) and included a) peer debriefing, b) intercoder reliability, and c) triangulation of data collected. A trained graduate student independently coded a subsample of 20% of randomly-selected protocols. Training included a discussion of the questions, the intent of the questions, and how to code the responses to each question. The degree of agreement between the assigned codes and category placements by the researcher and the second rater was the measure of reliability of the rating process. Training continued until 90% mean interrater agreement (IRA) was achieved. The mean IRA was calculated by dividing the number of agreements by the number of agreements plus disagreements, and multiplying by 100. Agreement with the researcher's coding on transcripts from the study was 95%.

Results

Poetry Profile

From four interview questions at the first poetry session, information regarding the students' reading preferences and experiences with poetry was obtained.

Reading preferences. Students' responses to the question about the types of things they like to read indicated that they enjoy reading a broad spectrum of genres, including poetry. Results show that 56% of students with LD expressed a preference for fiction, which included myth, mystery, fantasy, and humor, compared with 75% of AA students. A greater number of students with LD (41%) than AA students (25%) mentioned a preference for nonfiction, inclusive of social studies, health, and sports.

Poetry experience. When asked if they like poetry, more than half of the students (63%) indicated that they enjoy poetry, which represented an equal number of students with LD

and their AA peers. Thirty-eight percent of students with LD, compared to 25% of AA students, said that they did not like poetry, while 13% of AA students said that they liked poetry only "sometimes". Students were further asked if they knew any poems by heart, and if they did, they were required to recite them. Seventy-eight percent of all students said that they did not know any poems by heart, or had forgotten any previously known. Of these, 88% were students with LD, compared to 69% of AA students. Students who could recite a poem from memory referred only to "regular poems like *Roses are Red*" (an AA 6th grader). Her grade-level peer with LD responded, "Yes, Roses are red/Violets are blue/Sugar is sweet/And so are you… a valentine poem". No one named a "serious" poem. In addition, all of the students said that they had not heard of either poem that was part of the study. Eighty-eight percent of students with LD and 81% of AA students could not name any poets. None of the students mentioned hearing of Bobbi Katz, but 13% of them remembered hearing of Robert Frost.

Poem 1: "October Saturday"

The more contemporary poem, October Saturday, is a free verse that features a child, the speaker, who spends the entire day with dad raking "millions and millions" of leaves, while mother is in the house packing away their summer clothes. The activities of the day render the child tired and "dreaming of the box marked summer". This poem uses an extended metaphor that makes it structurally challenging. In this section, the interpretive strategies used by students with LD in comparison with their AA peers are discussed. These strategies are presented under the conceptual category of Poetry Comprehension, which is portrayed by four subcategories of Preview, Author's Craft, Interpretation, and Personal Response.

Poetry Comprehension

Preview. This subcategory highlighted the strategies of predicting and confirming. Students were read the title and asked to make a prediction and later confirm their predictions. Only one student with LD did not make a prediction. Using the title, as cue to meaning, all others referred to "October" and/or "Saturday" in their prediction. An interesting occurrence is that both groups of students went beyond the lower inference of using verbatim the words in the title to make higher order inferences about the season, weather conditions, and celebrations associated with a Saturday in October. Moreover, 44% of students with LD, compared to 19% of AA students associated the month of October with Halloween and predicted that the poem would be about that celebration:

"It's going to be October, and I think they will be celebrating a birthday on a Saturday. I think they will be preparing for Halloween, buying costumes and candy" (Grade 6 LD).

Sixty nine percent of students with LD confirmed their predictions, with 50% recognizing that their predictions were only partially confirmed. On the other hand, 81% of AA students confirmed their predictions, with 50% agreeing that only a part of their prediction actually happened in the poem ("Partly. It was October and a Saturday, but buying costumes did not happen" [Grade 6 LD]).

Author's craft. In this subcategory, the interpretive strategy of using poetic devices such as rhyme and figurative language to facilitate meaning was examined. There was only one end rhyming pair in this free-verse poem, which half of the students from each group overlooked. Students were also asked to identify literary devices, and to explain why the poet used the particular device, or how it helped them to understand the poem. Almost without exception, students did not know the technical terms for the literary devices, but undoubtedly recognized and understood how they functioned in the poem. For example, one fifth grader

with LD responded, "All the leaves have turned to cornflakes. They are comparing leaves with cornflakes."

The dominant figurative devices identified in this poem were comparisons, personification, and repetition. Students with LD (50%) outnumbered AA students (44%) in recognizing comparisons (metaphor) in the poem, and the only person to give an example of alliteration was a student with LD. Half of the students with LD (50%), and 44% of AA students were able to identify an example of personification. In explaining what the device meant, one grade six student with LD answered, "Personification- the leaves are nervously chattering, that means the wind blows the leaves and they rattle." Overwhelmingly, students (88% LD, 80% AA) recognized that Katz consistently repeated words and phrases like "raking, piles, and millions". Furthermore, when questioned about the purpose of the repetition, 75% of students with LD and 81% of AA students proffered plausible explanations showing that the poet wanted to illustrate a point; such as, A) explain what the leaves looked like, B) describe a repetitive action, and C) describe how the leaves sounded:

(A) "The leaves are crunchy like cornflakes and they are orange like cornflakes. This helps me see what the leaves act like-- like cornflakes. (B) The raking, raking lets me know that they keep on doing the same thing over and over, and they feel tired. (C) The leaves are nervously chattering lets me know that the leaves are making a bunch of sounds" (Grade 6 LD).

Students who mentioned that the literary device was used to make the poem interesting or to give details were all AA students (13%); while 25% of students with LD and 6% AA students, did not proffer any reason for the poet's use of the identified literary devices (see Table 3).

Table 3. *Interpretive Strategies Used in the Preview and Author's Craft Subcategories by Poem*

Subcategory	Interpretive Strategy	October Saturday		Stopping by Woods	
		LD %	AA %	LD %	AA %
Preview	Make prediction	94	100	94	100
	Confirm prediction	69	81	81	88
Author's craft	Identify literary devices				
	Rhyme	50	50	88	88
	Repetition	88	80	63	100
	Comparison	50	44	-	-
	Personification	50	44	-	-
	Alliteration	-	-	0	13
	Use of devices				
	Repetition				
	Reflect speaker's tiredness	-	-	56	75
	Create interest/excitement	0	13	6	19
	Illustrate a point	75	81	0	0
	Get reader's attention	0	0	6	0
	Alliteration				
	Create beat/rhythm	-	-	6	13

Interpretation. Questions in this subcategory examined the students' ability to use higher order strategies like making inferences, identifying theme, and using visual and sensory details to come up with underlying ideas and personal meaning. Students were asked to speculate why might the person in the poem be "dreaming of the box marked summer".

Sixty-two percent of students with LD, and 94% of their AA peers gave a response. Of these, 38% of students with LD and 50% AA students used existing schemata to focus on the items in the "box marked summer" (bathing suits, clogs, and flippers) to infer that the person wanted to swim and have fun. Forty-four percent of students with LD and 38% of AA students decided that the person was dreaming of the box marked summer because they simply could not wait for summer to arrive. On the other hand, a smaller number of students with LD (13%) than their AA peers (31%) proposed that the speaker was tired of fall or of raking. Some students offered more than one reason:

"Because she probably dreaming of the best summer ever… and she wants her summer to be good. She wants it to be summer soon because she's tired of the fall and all the leaves she has to rake". (Grade 6 LD).

Another question required students to determine the message or theme of the poem. Two distinct levels of analysis were evidenced here. The tendency of not moving beyond the plain sense of the poem, or of making a literal interpretation was mirrored in this research, where 38% of the students with LD and 25% of the AA students offered the basic story line as the poem's message: "(The message is)…that the leaves and the boy, and they were raking them, and they were millions and millions of cornflakes flying around, and they were chattering" (Grade 5LD). At the second level, 50% of students with LD and 69% of AA students demonstrated a higher level of analysis by venturing beyond the story line to offer a generalization about the poem's message. Nevertheless, the generalization was restricted to an object or idea specifically mentioned in the poem (e.g., raking leaves): "When you (are) raking leaves, it can't always be fun. Sometimes you get tired and then you want to lay down and dream of not raking" (Grade 5 LD). The remaining students did not generate a theme/message.

Personal Response. Questions in this section required students to make intertextual connections with the poem, to visualize and create sensory images of the poem's events, and to ask the poet questions. The answers to these questions portrayed the students' idiosyncratic and subjective interpretations of and reactions to the poem (see Table 4). Almost without exception, students (94%) made a personal connection with the poem. An equal number of students with LD and their AA peers (81%) made a connection with the family raking leaves, and 19% connected with the hard-working speaker. Fewer students made text-to-text connections (19% from each group). In the text-to-world category, AA students (66%) more than doubled the number of students with LD (31%) who made a connection.

In the visualization and creating sensory images subcategory, students went beyond the visual images of the poem's characters at work, or the changing colors of the sky, to give sensory details. Indeed, 75% of students with LD and 88% of their AA peers recalled hearing the noisy, blowing leaves. Some students even made the sound of the wind blowing. One quarter (25%) of students with LD, as compared to 38% of AA students recounted smelling the leaves or the fall air; and 31% from each group touched the crunchy leaves or felt the chilly air: "I see a dad and son raking. I see the leaves, and they pick up the leaves. The leaves are red, green, yellow, orange, and brown. I hear the wind blowing and the leaves making crunching noises. I smell the wind" (Grade 5 LD).

Students were given the opportunity to generate questions. Students with LD and AA students equally asked a total of 29 questions about the poem. About the poet, students with LD generated 18 questions, and their AA peers 25 questions. Twenty-five percent of students with LD, compared to 13% of AA asked questions that communicated their confusion about the poem's extended metaphor (e.g., "What does she mean by the 'giant's

baby brother had tipped the box'?"). Another 69% of the questions of students with LD and 63% of those of AA students focused on if the poet and the poem's speaker were the same individual. Questions also reflected the students' interest in the techniques of writing poems. Sixty three percent of students with LD and 50% of AA students asked questions about the poet's preferences and family life.

Students' Interactions

Interruptions. Placed in this subcategory were the interruptions made during the reading of the poem, since these may have offered an insight into the students' metacognitive activity as they sought to make meaning of the poem. Students interrupted to confirm a prediction, "All the leaves… My prediction was confirmed because I said the leaves would be falling" (6% of students with LD, 0% of AA students); make a connection, "Me and my brother rake the leaves into piles, too" (6% from each group); comment on the author's craft, "He repeating the words… Dad and I, and raking, raking" (6% of student with LD, 0% of AA student); or ask a question (0% students with LD, 13% of AA students).

Poem's effect. A major glimpse of the poem's effect on the students was gained through their recount of how the poem made them feel. Sixty-nine percent of students with LD, compared to 38% of AA students, responded with an emotion aroused by the poem (e.g., "Happy, because sometimes, when you read a poem, you can do the things that are in the poem in your life"), and what Hansson (1996) termed "evoked emotions". Thirteen percent of students from each group mentioned that the poem prompted them to want to perform an action like raking leaves, or working.

Ninety-four percent of students with LD and 88% of AA students reported that they enjoyed the poem. Eighty-one percent of students with LD versus 56% of AA students enjoyed the poem because they could relate to the topic or the speaker: "Yes, I liked 'I'm dreaming of the box marked summer,' because I'm dreaming of summer now". A further 19% of students with LD, compared to 50% from the AA group enjoyed some element of the author's craft or use of specific literary devices. Again, some students gave more than one reason for their enjoyment.

Poem 2: "Stopping by Woods on a Snowy Evening"

"Stopping by the Woods on A Snowy Evening," the more traditional poem, tells about a man who delays his journey to stop and watch the "lovely, dark, and deep" woods fill up with snow. The vocabulary, syntax, and unfamiliar concepts add to the challenge of this poem.

Poetry Comprehension

Preview. As with Poem 1, most students demonstrated knowledge of using title as cue to the poem's content. Eighty-one percent of students with LD, and 88% of their AA peers used words from the title to predict what the poem would be about. Predominantly, students (100% LD, 94% AA) made inferences about the types of activities in which the poem's speaker would be engaged, and most students speculated that the person stopped to cut wood, or a tree: "I think the (poem) is going to be about one day when he went to the woods on a snowy evening, and he probably cut a tree down to decorate it" (Grade 5 LD). Predictions were fully confirmed by one quarter of students with LD (25%) and 44% of AA students, while 56% of students with LD and 44% of their AA peers said that their predictions were partially confirmed.

Table 4. *Interpretive Strategies Used in the Interpretation and Personal Response Subcategories by Poem*

Subcategory	Interpretive Strategy	October Saturday		Stopping by Woods	
		LD	AA	LD	AA
		%	%	%	%
Interpretation	Make inference	63	94	88	88
	Identify theme				
	Surface meaning	38	25	50	31
	Inference about topic	0	0	25	13
	Generalization about topic	50	69	13	50
	Broader generalization about life	0	0	6	6
Personal response	Make connections				
	Text-to-self	94	100	75	100
	Text-to-text	19	19	50	31
	Text-to-world	31	66	50	75
	Provide sensory details				
	Sight	88	81	100	100
	Hearing	75	88	63	88
	Smell	25	38	6	0
	Touch/Feel	31	31	88	44
	Taste	6	13	6	31
	Generate questions				
	About poem				
	Meaning	25	13	13	6
	Poem's content	0	0	63	69
	Speaker	69	63	38	63
	Writing poems	19	50	56	69
	About poet				
	Family life, preferences	63	50	38	44
	Poet's writing	25	50	44	56

Author's Craft. The literary devices identified in this poem were repetition, alliteration and rhyme. All AA students and 63% of students with LD took note of the repetition of the poem's final line ("And miles to go before I sleep"). Students with LD did not offer rhyme as a literary device, while 31% of AA students did; however, rhymes were identified by 88% of both students with LD and AA students. Alliteration was pinpointed by 13% of AA students, but by no students with LD. Another 25% of students with LD did not recognize any literary devices in the poem, compared to 6% from the AA group. More than half of students from each group (56%, LD, 75%, AA) suggested that the poem's repetition was used to show that the speaker was tired or sleepy, or that he had a great distance to go (e.g., "He wants you to know that the person is maybe tired, and he got far to go before he can sleep"). Six percent of students with LD and 19% of AA students reported that the repetition was used to make the poem "interesting".

Interpretation. Students were required to infer if the speaker loves the snow. An equal percentage of students with LD and AA students (88%) decided that the speaker loves the snow because he stops to enjoy the snow even though he has "miles to go," and/or that he describes the snowy woods as "lovely, dark, and deep". In identifying the poem's message or theme, students used four distinct levels of analysis that seem to reflect varying levels of complexity. At the first level was the literal interpretation, where 50% of students with LD, and 31% of AA students recounted the story line as the poem's message ("Snow by the

woods. It was like snowing"). At level two, 25% of students with LD and 13% of AA students perceived the message as an inference about the topic ("He's saying that he enjoys the snow being out in the woods"). The third level of analysis was when students (13% of students with LD, 50% of AA students) offered a generalization about the topic as the poem's message ("When you are outside in the forest, when it is snowy, it looks beautiful and lovely, and you should admire nature even though you have a long way to go"). The fourth and highest level was attained by one student with LD and one AA student whose message was a broader generalization about life (e.g., "In life, you should stop for a little while to see or do something you enjoy").

Personal response. Most intertextual connections were of the text-to-self type, with 75% students with LD, and 100% AA students making a personal connection with the snow and the darkened evenings of winter. More students with LD (50%) made a text-to-text association than AA students (31%). The poem reminded 6% of AA students of another poem. In making a text-to-world connection, 50% of students with LD compared to 75% of AA students associated the poem with a movie, television show or something they had heard or seen on the news. In creating visual and sensory imagery, all students painted a visual picture of the speaker out in the snowy woods, but it was interesting the range of speakers that students "saw" in the poem, ranging from "the little girl," to "a boy," and "a man". Unlike "October Saturday," this poem was, for the most part, silent. Sixty-three percent of students with LD and 88% AA students heard sounds of the bells, wind, and imagined animals. Students with LD (88%) doubled AA students who touched or felt the snow and its effect. Thirty-one percent of AA students, but only 6% students with LD, used their sense of taste to interact with the poem ("I can taste the snow like water"). Students with LD generated a total of 32 questions about the poem, while AA students asked 30. Most questions asked about this poem were related to the poem's content with 63% of students with LD and 69% AA of students asking questions like, "What promises he had to keep?" Twice as many students with LD (13%) than AA students (6%) had a question about the poem's meaning, "What does he mean by 'the sweep of easy wind and downy flake'"?

Students' Interactions

Interruptions. Interruptions made during the reading of this poem were sparse with 78% of students not interrupting, although encouraged to do so. Six percent of AA students interrupted the reading of the poem to confirm a prediction and to offer a summary of the poem, while no students with LD did. Another 6% of students with LD and 25% of AA students paused the reading to ask the meaning of the words "queer" or "harness-bells".

Poem's effect. When asked "How did the poem make you feel?" most students (75% of students with LD, 63% of AA students) responded favorably with an emotion evoked by the poem. For example, a grade 5 student with LD sided with the speaker, "Good. It makes me feel like I can love snow". Students said that the poem prompted them to want to perform an action. A few students (13% LD, 6% AA) even articulated a sensory effect, and said that the poem made them feel "cold". Students were further asked if they enjoyed the poem and to state why or why not. Overwhelmingly, students (100% LD, and 94% AA) reported enjoying the poem, with some students offering more than one reason for their enjoyment. For the most part, students (75% LD, 81% AA) relayed enjoying the poem's content or story line. Furthermore, 19% of students with LD and 25% of AA students offered a positive evaluation of the poem as a reason for their enjoyment: "Yes, because it is a lovely poem about the snow."

Discussion

This investigation of interpretive strategies used by students with and without LD reveals much about their interactions with and comprehension of poetry. Students with LD used a broad range of interpretive strategies inclusive of predicting and confirming, identifying and understanding literary devices, making intertextual connections, interpreting theme, questioning, inferring, and visualizing. They performed as well as their AA peers in making sense of two poems with varying levels of complexity. However, some areas of difficulty surfaced in relation to understanding an extended metaphor, not moving beyond the surface meaning of the poems, and in placing more emphasis on evoked emotions than on understood emotions in their poetic processing.

Interpretive Strategies

The interpretive strategy of predicting and confirming is a well established task for facilitating comprehension. Students with LD demonstrated that they were as equally able as their AA peers to use the title of poems to make adequate predictions about the poems' content. Furthermore, students with LD used the title to make inferences about the setting, weather conditions, and activities in which the poems' speaker would be engaged. The responses of students also revealed that they had preexisting schemata which helped them to interpret the title.

Figurative language is an integral element of poetry used to portray and reflect meaning, but poor comprehenders (Cain & Towse, 2008) usually have difficulty with such a device because they tend to be more literal in their reading and interpretation. However, in this research, students with LD, who are often poor comprehenders, exemplified skill in identifying examples of metaphor, personification, alliteration, and hyperbole, though they did not know the technical terminology. Beyond mere identification, students with LD demonstrated an understanding of how the poems' meaning hinged upon these devices. To illustrate, in explaining the poets' use of personification and metaphor, students talked about the noise made by the "nervously chattering" leaves of "October Saturday," and how they looked liked "lots and lots" of cornflakes on the lawn. However, though recognizing the poet's use of metaphor in "October Saturday" in calling the leaves cornflakes, the comments and questions of one quarter of students with LD indicated that they were stunted by the use of the extended metaphor in the same poem, illustrating what Miall and Kuiken (1994) called "defamiliarization". The students appeared unable to reconcile the reality of the speaker's character with the apparent fairy-tale character of a giant, as students with LD voiced their confusion. This confusion also speaks to the tendency of students with LD to read literally and to give a prosaic interpretation to figurative language (Sekeres & Gregg, 2007). Their images of a literal giant in the poem did not fit in with the rest of the poem's characters, thus creating "contextual (in)consistency" (Nesi et al., 2006).

Visualization, and other sensory-based responses, is another type of interpretive strategy that is pertinent to comprehension (Pressley & Afflerbach, 1995) across genres. While reading, visualization places an emphasis on sensory responses that could arouse multiple neural pathways that broaden the reader's observations (Holbrook, 2005). In their attempt at comprehending the poems, students with LD adopted an aesthetic stance (Rosenblatt, 1995), considering both their cognition and affect in the process. Students entered imaginatively into the world of the poems to identify with the poems' speakers, and to express empathic understanding. Their descriptions of sensory details communicated that they were having a lived-through experience with the poems. Students reported feeling cold from being out in the woods, or feeling tired from "all that raking". Here, the visualizations

enhanced their interpretations and helped them to understand the speakers' experiences, by virtually taking on their perspectives.

The interpretive strategy of identifying theme may also prove problematic to students with LD as it involves higher order skills of making inferences and generalizations. Students exemplified a four-level hierarchy of analysis in identifying the poems' theme or message. The first level was the literal level where students gave the basic "story line" or surface meaning of the poem. For "October Saturday," students with LD made a greater number of broader generalizations than surface meaning responses, indicating that they moved beyond the "plain sense" interpretation, and that this poem was more accessible to them. At the second level, students made inferences about the poems' speaker- his or her thinking and feelings, or about the topic. The latter two levels respectively featured generalizations about the topic, and broader generalizations about life. For the more traditional poem, "Stopping by Woods," fewer than a quarter (19%) of the students with LD, but more than half (56%) of their AA peers moved to this level of meaning, which extended the poems' "plain sense" to include greater "poetic significance" (Harker, 1994), and provided for a more sophisticated interpretation. These results seem to suggest that students with LD operated at the surface level of interpretation for the traditional poem, but went on to greater interpretive significance for the more contemporary poem. It seems that once the students with LD got past the extended metaphor of the "giant's baby brother" spilling his cornflakes that the poem's free verse, contemporary language, and the described activity to which students readily connected rendered this poem "easier". It could be that the greater conceptual and linguistic divide of "Stopping by Woods" reduced accessibility to the students' with LD and limited the recognition of the generalizability of the poem's theme, and their ability to glean deeper meaning.

Students juxtaposed the text of their experiences with the text at hand to aid with the comprehension process. It appeared to the students' advantage that the data collection period took place toward the end of the fall semester, when students had fresh experiences of the falling leaves of autumn, and the early pre-winter snows. In their interaction with the poems, students with LD made intertextual connections, utilizing their background knowledge and references to relate the poems to their personal experiences, and other texts such as poems, books, movies, and various cultural media. Text-to-text connections, however, were the least made. Similar results were reported by Sipe (2000) who found that second graders in response to story book read alouds, made fewer text-to-text connections than text-to-self. Nevertheless, both students with LD and their AA peers realized the connection between poetry and their life experiences, recognizing the significance of poetry as a "lifeworld" or life itself. Gordon (2009) used the term "lifeworld" to refer to "the voice, history, and culture" (Gordon, 2009, p. 166) of an individual- the poet, the poem's speaker, or the reader or listener. Every encounter with poetry, therefore, is a convergence of two "lifeworlds"- that of the reader, and the extended world of the poem, creating other "lifeworlds" as students come away with deeper cultural knowledge and critical understanding.

Another interpretive strategy that was used by students with LD as freely as their AA peers was generating questions about the poems and the poets. The questions asked about the poems from students with LD indicated that they wanted uncertainties settled, inquiring about the meaning of words, figurative devices, and the speaker. Their questions about the poet were mostly about if the poet and the speaker were the same individual, and about writing poems in general. The questions about the poems' speaker basically reflected a narrative approach to the comprehension of the poems; first, identifying the poems' speaker or character, and then, creating a storyline for him or her. These findings are consistent with

Eva-Wood's (2008) research where students in their engagement with poems began with a basic outline of the speaker before going on to deeper analysis of inferring thoughts and feelings, and eventually identifying with the speaker.

Poetry Enjoyment

It seems that, for the most part, the relationship between the complexity of the poems and the level of difficulty experienced in comprehending the poems and students' enjoyment of them did not impact student enjoyment. Most students indicated that they enjoyed the poems regardless of difficulty or challenge. A possible variable that may have influenced the students' enjoyment of the poems was the mode of presentation. In this study, students listened to tape-recorded versions of poems, while following along on personal scripts. Recent research (e.g., Gordon, 2009) has lauded the benefits of "heard" poetry. He investigated how middle and secondary school students reacted to poems they heard (without printed text) and afterward discussed. Teachers reported how the students responded well to the listening activities, asked for specific details to be replayed, and initiated discussion about these details.

The overwhelming number of students who reported enjoying the poems gave insight into their comprehension based on Hansson's (1996) model of poetic understanding. He placed poetic processing on an affective-cognitive continuum with synthetic understanding at the affective end, and analytic understanding at the cognitive end. In reading synthetically, the reader is controlled by primary emotions (evoked emotions) felt while reading the poem. With analytic processing, emotional processes are not as important as cognitive processes, and emotions (understood emotions) are the results of the reader's reflection on the poet's style. Readers then express enjoyment as a result of the poet's craft. From this perspective, students with LD operated more at the synthetic end of the continuum than their AA peers, with only 6% of these students expressing enjoyment of either poem because of the poet's style. On the other hand, half of the AA students attributed their enjoyment of "October Saturday" to some element of the poet's craft, showing an emphasis on understood emotions, while only 19% enjoyed "Stopping by Woods" for the poet's stylistic qualities. Finally, poetic enjoyment by both groups of students was mainly attributed to the poems' subject matter, suggesting that if students can connect with the topic at hand, comprehension may be a less difficult task.

Pedagogical Implications

The findings of this research offer suggestions for designing curricular activities and interventions to draw elementary students with and without LD to a greater level of comprehension proficiency in general, and poetry comprehension in particular. The types of poems that students were able to recite from memory were either silly or fun verses, showing a lack of knowledge of more serious poems. In addition, none of the children referred to a favorite song or rap as poetry, also demonstrating a limited conception of poetry. Poem selection should reflect what poetry is, that is, a medium for self expression that helps readers (and listeners) develop new ways of seeing and understanding the world (Gill, 2007). It may be that the students' enjoyment of different types of poetry may be enhanced with exposure to a broader and varied selection of poems.

In general, both students with and without disabilities did not know the technical terms for the literary devices identified in the poems. Students must be taught the technical terms, as knowledge of these is critical for poetry comprehension. Students should also be able to identify and distinguish between these devices by name as well as function. Very often these devices occur in classroom texts. Teachers should use these opportunities of exposure to consolidate student knowledge by asking students to name the device and to state what it

means in the context of the reading selection. Students also tend to use metaphors frequently in their everyday speech. For example, "I'm a beast" is commonly said when students exhibit genius in answering a question correctly, or scoring a high grade. Teachers can turn such expressions into teachable moments, by having students explain their meaning, and then pointing out the difference in literal and figurative meaning. In a recent study, researchers Peskin, Allen, and Wells-Jopling (2010) taught 14 and 15 year old students how to use symbolic interpretation of poetry to help with gaining meaning. These students were taught universal meanings of symbols and metaphors, which helped them to look for a range of possible meanings within the poems. Regarding the comparatively small number of text-to-text connections made, teachers must make concerted efforts to provide students with opportunities for making such connections. An emphasis is often placed on making text-to-self connections in the elementary classrooms with having students record these connections during reading. Similarly, text to text connections should be placed along with text-to-self and text-to-world, so that students become equally familiar with this subcategory of intertextual connections.

Finally, students in this research had many questions about how the featured poets wrote poems, indicating an interest in poetry writing. Perhaps, reading/writing connections could be forged by providing student with opportunities for writing their own experiences, life stories, and responses to poetry in narrative and poetic forms. It is interesting the depth of understanding that both groups of students showed from listening to the poems only twice, while following along on personal scripts. One can just imagine how much more students could garner from poetry in a discussion format, and with added background information about the poets and the context of their writing.

Limitations of the Study

The relatively small sample size limits the generalizability of findings. Another limitation of the study is the students' unfamiliarity with the researcher. Interviewing is a social interactional event that is affected by the context of the interview. Some students may have been shy to answer or to ask questions, and non-response may not represent a lack of skill in the use of a particular strategy, as is being assumed in this research.

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Students' Performance Calibration in a Basketball Dibbling Task in Elementary Physical Education

Athanasios KOLOVELONIS *
University of Thessaly, Greece

Marios GOUDAS
University of Thessaly, Greece

Irini DERMITZAKI
University of Thessaly, Greece

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Abstract

The aim of this study was to examine students' performance calibration in physical education. One hundred fifth and sixth grade students provided estimations regarding their performance in a dribbling test after practicing dribbling for 16 minutes under different self-regulatory conditions (i.e., receiving feedback, setting goals, self-recording). Two calibration indices, calibration bias and calibration accuracy, were calculated. The results showed that students who practiced dribbling under different self-regulatory conditions (i.e., receiving feedback, setting goals) did not differ in calibration bias and accuracy. Regardless of the group, students were overconfident. Moreover, sixth grade students were more accurate compared to fifth grade students. These results were discussed with reference to the development of performance calibration and self-regulated learning in physical education.

Keywords: Calibration, Physical Education, Grade/Gender Differences, Self-Regulation, Basketball Dribble

Introduction

The development of self-regulated learners is a major educational goal (Boekaerts, 1997). Self-regulated learning is an active, self-directive process whereby students monitor, regulate, and control their cognition, motivation, affect, behavior, and environment to achieve their goals (Efklides, Niemivirta & Yamauchi, 2002). Self-regulated students see

* Athanasios Kolovelonis, Department of Physical Education and Sport Science, University of Thessaly, 42 100 Karies, Trikala, Greece. Phone: +30 24310 47045. E-mail: sakisanta@hotmail.com

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themselves as agents of their own behavior, believe that learning is a proactive process, are self-motivated and use strategies to achieve their academic goals. It has also been supported that the development of self-regulated learning is associated with positive learning outcomes in both academic and physical education settings (Kitsantas, Steen & Huie, 2009; Zimmerman, 2002). In fact, recent research in elementary physical education has shown that students can effectively use self-regulatory processes, such as goal setting, self-recording, and self-talk, to enhance their performance in motor and sport skills (Kolovelonis, Goudas & Dermitzaki, 2010, 2011a, 2011b, in press; Kolovelonis, Goudas, Hassandra & Dermitzaki, 2012).

To become self-regulated learners, students need to monitor accurately their ongoing cognitive states and processes, and to use the information obtained from this monitoring to regulate those processes (Hacker, Bol & Keener, 2008). Thus, a factor associated with self-regulated learning is calibration which is the degree to which a person's perception of performance corresponds with his or her actual performance (Keren, 1991). Calibration is considered one component in the process of developing self-regulatory competency and is a metacognitive skill for monitoring one's performance (Pieschl, 2009; Zimmerman, 2008). Learners make judgments about what knowledge or skill they have learned, and those judgments are compared to an objectively determined measure of that knowledge or skill (Winne, 2004). The more closely students' predicted performance matches their actual performance, the better calibrated they are (Hacker, Bol & Bahbahani, 2008). The underlying psychological process reflected in calibration entails a person's monitoring of what he or she knows about a specified topic or skill and judging the extent of that knowledge in comparison to some criterion task, such as an examination or a test (Hacker et al., 2008).

Calibration is educationally important because of its implications regarding students' motivation (Schunk & Pajares, 2009) and metacognitive control processes and self-regulation (Efklides & Misailidi, 2010). In particular, students who overestimate their capabilities may attempt challenging tasks and fail, which would decrease their subsequent motivation, whereas those who underestimate their capabilities may avoid challenging tasks limiting their potential development of necessary skills (Schunk & Pajares, 2004). Moreover, overconfidence may decrease effort exertion when needed (Efklides & Misailidi, 2010), provide a false sense of the strategy's effectiveness (Hacker, 1998), whereas students who underestimate what they can do may be reluctant to try the task and thereby retard their skill acquisition. Furthermore, more accurate monitoring has been shown to lead to improved self-regulation and thus to higher performance (Thiede, Anderson & Therriault, 2003).

Calibration research has shown that students are often inaccurate in judgments of their capability on a task or test (Chen, 2003; Hacker & Bol, 2004) with a tendency to overconfidence (Keren, 1991). In general, underconfidence is associated with higher performance and overconfidence with lower performance (Hacker et al., 2008). Stone (2000) hypothesized that self-regulated learners are well calibrated. However, it seems that calibration accuracy is hard to learn or resistant to change. Previous efforts to improve calibration accuracy have shown mixed results. Some studies have found modest gains in participants' ability to predict and postdict performance (Hacker, Bol, Horgan & Rakow, 2000; Nietfeld & Schraw, 2002) but some other have reported no significant change in calibration accuracy after practice or other interventions (Bol & Hacker, 2001; Bol, Hacker, O'Shea, Allen, 2005). Zimmerman, Moylan, Hudesman, White and Flugman (2008) found that an intervention designed to improve students' self-reflection improved the accuracy of students' self-monitoring of their problem-solving performance.

In sport and physical education research using the calibration paradigm to judge metacognitive bias normally varies from calibration testing in the cognitive domain, in that participants are immediately aware of their result in physical tasks (Fogarty & Ross, 2007). In particular, sport activities differ from academic ones by the presence of readily observable performance feedback (i.e., knowledge of results). For example, a basketball player can see after the execution if he was successful in the shot (Feltz & Magyar, 2006). Thus, in motor and spots skills where immediate feedback is provided in the form of success or failure calibration becomes an integral part of learning the task and environmental cues are always available to ensure the accuracy of calibration (Horgan, 1992). Furthermore, competence is not wholly dependent on knowledge but also depends on actual physical skill.

Calibration research in sport and physical education is limited. Fogarty and Ross (2007) asked participants to estimate how many tennis serves out of the 10 they could hit into the target area. Results showed that players were well calibrated on the easier task, but overconfident on the more difficult task (i.e., smaller target area). In a similar study (Fogarty & Else, 2005) golfers completed a putting and a chipping task after first estimating how well they would perform on each of these tasks. It was found that golfers were well calibrated on easier tasks (putting) and overconfident on more difficult tasks (chipping and pitching). Participants were also overconfident on the golf rules test, a result which was consistent with results in cognitive calibration research. McGraw, Mellers, and Ritov (2004) found that most recreational basketball players were overconfident regarding their shooting performance, but those who were more overconfident experienced less enjoyment. In a recent study in physical education, Kolovelonis, Goudas, Dermitzaki and Kitsantas (in press) found that performance calibration did not differ between students who practiced dribbling receiving social feedback and setting process or performance goals and control group students.

Undoubtedly, students' performance calibration in physical education is unexplored. Therefore, considering the important implication of students' performance calibration regarding their motivation and self-regulation (Efklides & Misailidi, 2010; Schunk & Pajares, 2009) further research is needed to examine the status of students' performance calibration in elementary physical education.

Furthermore, no study to our knowledge has examined grade and gender differences in students' performance calibration in physical education. It has been theorized that capability self-beliefs become more accurate and specific with age and cognitive maturity (Schunk & Miller, 2002) because students become more realistic about their capabilities, are better equipped to interpret multiple sources of information about competencies, and have a more differentiated view of their abilities (Eccles, Wigfield & Schiefele, 1998). Thus, in the present study differences between fifth and sixth grade students in performance calibration were examined.

Regarding gender differences, previous research in academic settings has shown contradictory results regarding the role of gender in self-efficacy judgments as well as in calibration (Chen, 2003). Some research has reported gender differences in calibration among fifth graders, but not among middle school or high school students (Chen, 2003). Furthermore, some research has reported gender differences in students' beliefs regarding their capabilities (i.e., self-efficacy) favoring adolescent boys, some have reported differences favoring girls, and others has revealed no gender differences (Schunk & Meece, 2006). In view of these mixed findings, the role of gender in students' performance calibration requires further examination, particularly in physical education where this kind of research is limited.

The aim of this study was to explore fifth and sixth grade students' calibration regarding their dribbling performance in physical education. Moreover, grade and gender differences in

performance calibration were examined. We hypothesized that students would overestimate their dribbling performance, and sixth grade students would be better calibrated compared to fifth grade students. No specific hypothesis for gender differences was established due to previous mixed results.

Method

Participants

Participants were 100 students (40 boys and 60 girls) between 11 and 12 years of age, who attended two fifth grade (40 students) and three sixth grade (60 students) physical education classes from two elementary schools located in a medium-sized city in central Greece. Students participated in the study voluntarily. No student refused to participate. Students had little previous experience in the basketball dribble and none of them participated in basketball clubs out of school. Students were randomly assigned to five groups using the proportional stratified sampling method and practiced dribbling under different conditions (see procedure section).

Measures

Basketball dribble. Students had to dribble among five cones that had 3.05 m distance between each other. The distance between the first cone and the starting line was also 3.05 m. The test lasted 30 seconds and each student's score was the total number of cones that he or she dribbled successfully. Students were asked not to touch the cones during dribbling, to change the dribbling hand in each cone and to collect the ball by themselves in the case of losing its control. High test-retest reliability (r : .95) has been reported for this test (Barrow & McGee, 1979).

Calibration. Prior to the dribble post-test students were asked the question: "How many cones will you dribble in the post-test?" Based on this estimation and students' actual scores in dribbling post-test two calibration indices were computed, the bias and the accuracy score (Hacker et al., 2008). Calibration bias was computed as students' estimated performance score minus the actual performance. Calibration bias is an index of the direction of the calibration. Positive bias indicates overestimation of performance and negative bias underestimation. The absolute values of the bias scores resulted in the accuracy index which reflects the magnitude of calibration error. Values closer to zero indicate higher calibration accuracy.

Procedure

Permission to conduct the study was obtained from the Greek Ministry of Education Lifelong Learning and Religious Affairs and the school principals. Students participated in the study in groups of four, in the school gym, with the presence of a trained experimenter who was a physical education teacher blind to the aims of the study. Students were told that the purpose of the study was the improvement of their dribbling skill. Initially, students were informed about the procedure of the study which consisted of the dribbling pre-test, the dribbling instructions and modeling, the 16-minute practice phase, and the post-tests. After the initial guidelines, students were informed about the scoring system, performed a trial run and then they were pre-tested in dribbling. Then, students were provided with oral dribbling instructions and observed the experimenter's dribbling demonstration.

Next, all students practiced the dribble for 16 minutes following different self-regulatory conditions, which included either the practice with social feedback or the simple practice in the first 8 minutes and setting process or performance goals in the next 8 minutes. In particular, in the first 8 minutes Group 1 and 2 students practiced dribbling receiving social

feedback (affirmative responses, performance reminders, and reinforcement). In the next 8 minutes Group 1 students set process goals (i.e., focus on dribbling low with fingers-wrist) and Group 2 students set performance goals (i.e., improving 20% their pre-test scores in dribbling test). Students of both groups self-recorded their performance. Group 3 and 4 students practiced dribbling without receiving social feedback in the first 8 minutes, but they set the same process (Group 3) or performance (Group 4) goals and self-recording their performance in the next 8 minutes. Control group students practiced the dribble without receiving social feedback, setting goals or self-recording. After the end of the practice students answered the calibration question and were post-tested in dribbling.

Statistical Analyses

Group differences in calibration bias and accuracy were examined with separate analyses of variance. Grade and gender differences on calibration bias and accuracy were examined with separate 2 (grade) X 2 (gender) analyses of variance. Effect sizes of partial η^2 and Cohen's *d* were also calculated (Cohen, 1988).

Results

Means and standard deviations of students' calibration bias and accuracy scores separate for each grade and gender are presented in Table 1.

Table 1. *Means and Standards Deviations for Calibration Bias and Accuracy Scores*

	Fifth Grade						Sixth Grade					
	Total		Boys		Girls		Total		Boys		Girls	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Calibration Bias	5.30	7.13	5.85	7.65	4.75	6.71	2.97	5.75	2.22	4.77	3.33	6.21
Calibration Accuracy	6.70	5.79	7.85	5.45	5.55	6.03	4.73	4.38	4.25	3.01	4.98	4.94

Note: Positive calibration bias scores indicate overestimation of performance. Calibration accuracy scores closer to zero indicate higher accuracy.

The one-way ANOVA showed a nonsignificant difference between groups in calibration bias, $F(4, 95) = 0.73$, $p = .57$, and accuracy, $F(4, 95) = 0.99$, $p = .41$. Thus, students of all groups were pooled to examine grade and gender differences in calibration bias and accuracy in the total sample.

In calibration bias, the 2 (grade) X 2 (gender) ANOVA showed a nonsignificant main effect for grade, $F(1, 95) = 3.55$, $p = .063$, and gender, $F(1, 95) = 0.00$, $p = .99$, and a nonsignificant Grade X Gender interaction, $F(1, 95) = 0.67$, $p = .42$.

In calibration accuracy, the 2 (grade) X 2 (gender) ANOVA showed a significant main effect for grade, $F(1, 95) = 4.01$, $p = .048$, partial $\eta^2 = .04$, a nonsignificant main effect for gender, $F(1, 95) = 0.57$, $p = .45$, and a nonsignificant Grade X Gender interaction, $F(1, 95) = 2.11$, $p = .15$. That is, regardless of the gender, sixth grade students were more accurate ($M = 4.73$, $SD = 4.38$, $d = 0.38$) compared to the fifth grade students ($M = 6.70$, $SD = 5.79$).

Discussion

The aim of this study was to examine students' performance calibration in physical education. Students provided estimation measures regarding their dribbling performance after they had practiced dribbling for 16 minutes following different self-regulatory conditions. Two calibration indices were calculated, the bias and the accuracy index (Hacker et al., 2008). The results showed no difference among groups in calibration bias and accuracy. Next, data from all groups were pooled and analyzed to examine grade and gender

differences in students' performance calibration. The results showed a main effect for grade in calibration accuracy.

In particular, sixth grade students were more accurate in estimations regarding their post-test dribbling performance compared to fifth grade students. This result is consistent with views that capability self-beliefs become more accurate and specific with age and cognitive maturity (Schunk & Miller, 2002). Growing up students become more realistic about their capabilities, are better equipped to interpret multiple sources of information about competencies, and have more differentiated views of their abilities (Eccles et al., 1998). It has been supported that younger students typically overestimate how much they can remember or learn, whereas older students' estimates of memory and learning are much closer to their actual performance on academic tasks (Lan, 2005). Moreover, another possible explanation of this result maybe the fact that sixth grade students displayed higher competence in dribbling performance compared to fifth grade students. Calibration accuracy correlates positively with performance (Bol & Hacker, 2001; Chen, 2003). Furthermore, it has been found that low-achieving students are less accurate and have a greater tendency towards overconfidence than high-achieving students who are more accurate tending to be slightly underconfident (Bol & Hacker, 2001; Hacker & Bol, 2004; Hacker et al., 2008; Horgan, 1992; Keren, 1987; Kruger & Dunning, 1999). However, this interpretation needs further examination because other research did not support it (Fogarty & Else, 2005).

No difference was found between genders in calibration accuracy. Previous research in academic settings has shown contradictory results (Chen, 2003; Schunk & Meece, 2006). Girls often perform as capably as boys in various academic domains but they may report lower self-efficacy, especially at higher academic levels (Schunk & Pajares, 2009). In sports setting, females may report lower levels of self-efficacy probably because their performance is usually inferior compared to males. Moreover, males may underestimate the demands of a task, and females may devalue their abilities (Feltz, Short & Sullivan, 2008). However, in the present study, the levels of calibration accuracy regarding dribbling performance were similar in both boys and girls. Undoubtedly, the role of gender in students' performance calibration in physical education requires further examination.

Regarding calibration bias no grade or gender difference was found. Calibration bias is an index of the direction of the calibration. Positive values in this index were found in both grades and genders indicating that students overestimated their dribbling performance. This result is consistent with previous findings in sport settings showing that athletes were overconfident regarding their performance, especially in more difficult tasks (Fogarty & Else, 2005; Fogarty & Ross, 2007; McGraw et al., 2004). Probably, students might have perceived the dribbling test as difficult because they were not accustomed to estimate how many cones they could dribble in a specific time. It has also been supported that students may deliberately overestimate their performance to look good to the experimenter or even to themselves (Baumeister, 1998). However, these interpretations need further examination.

No difference was found among students who practiced dribbling under different self-regulatory conditions. This result is consistent with Kolovelonis, Goudas, Dermitzaki, and Kitsantas' (in press) findings that students who practiced dribbling with social feedback and set process or performance goals did not differ in calibration accuracy from control group students. It seems that calibration accuracy is hard to learn or resistant to change. Probably, feedback and practice alone are insufficient for improving calibration accuracy (Hacker et al., 2008). Previous efforts to improve calibration accuracy have shown mixed results. Zimmerman et al. (2008) found that an intervention designed to improve students' self-reflection improved students' self-monitoring accuracy. Thus, when a self-regulated learning

intervention designed explicitly to improve students' self-reflection can improve their accuracy in self-monitoring. However, in the present study, none explicit technique for improving calibration was adopted. Therefore, self-regulatory practice does not automatically increase calibration accuracy, unless this is explicitly pursued through a well-designed and specific intervention. Such an intervention should enhance students' self-reflection processes regarding their achievement, help them to self-reflect on their errors, and encourage them to seek assistance from their teacher or a peer (Zimmerman et al., 2008).

Performance calibration has implications regarding the development of self-regulated learning. It has been supported that self-regulated learners are well calibrated students (Stone, 2000). Students need to accurately monitor their performance and the effectiveness of the processes they use during practice because this information would be used to regulate these processes and performance (Hacker et al., 2008). More accurate monitoring has been shown to lead to improved self-regulation and higher performance (Thiede et al., 2003). Calibration has also implications regarding students' motivation (Schunk & Pajares, 2009). Horgan (1992) has suggested that good calibration has motivational benefits. Students with good calibration tend to make controllable attributions for both success and failure. These attributions have fewer harmful effects regarding future participation because are adaptive for students' learning and can help them to focus on improving themselves, persisting in their learning efforts and mastering the new skill (Schunk, 2008). Conversely, poor calibrated students, especially those who are overconfident, are unlikely to learn from their mistakes, may suffer frustration, and lack of motivation to continue their efforts. Well-calibrated people are accurate in judging their capability to perform a task, and thus they learn more effectively (Schunk & Pajares, 2004).

Students' performance calibration can have practical implications regarding learning skills in physical education. Overconfident students may believe that they have master a skill, and thus they may put less effort during practice and may lack motivation to continue to strive for the highest levels of achievement (Horgan, 1992). On the other hand, students who underestimate their capabilities may avoid challenging tasks limiting their potential development of necessary skills (Schunk & Pajares, 2004). Thus, physical educators should help students to become well calibrated in physical education. Students should be helped to fully understand the demands of the task, and what success at the tasks requires in order to prevent them from overestimating or underestimating what they can do. Greater experience with various tasks informs students regarding the skills needed to succeed (Schunk & Pajares 2009). Moreover, good calibration may facilitate effective goal setting. In particular, the calibration methodology is an effective way of assessing the realism of goals that students set (Fogarty & Else, 2005).

Furthermore, performance calibration is associated with some teaching styles. The reciprocal and the self-check styles are two teaching styles that can enhance students' performance in physical education (Kolovelonis, Goudas & Gerodimos, 2011). These styles involve students in the process of observing and recording their peers or their own performance. Consistent with the results of the present study, Kolovelonis and Goudas (2012) found moderate levels of accuracy with a tendency to overestimation in students' recordings of their peers and their own chest pass performance. Training students in using these styles giving emphasis on improving their accuracy on discriminating their own or their peers' performance may enhance students' performance and calibration accuracy in physical education (Byra, 2004).

A possible limitation of this study concerns the fact that students predicted their dribbling performance in a single trial. Future research should involve students to estimate their

performance in more than one single trial and examining students' performance calibration including various types of motor and sport tasks (e.g., open or closed, gross or fine, discrete or continuous skills) from various sports. Furthermore, factors associated with students' performance miscalibration should be explored. The difficulty of the task and the provided feedback as well as students' self-perceptions and personality characteristics may affect the status of their performance calibration in physical education. Finally, although students in this study practiced dribble under different self-regulatory conditions, they were not explicitly trained to estimate their dribbling performance during practice. Thus, the development and evaluation of interventions designed to improve students' performance calibration in physical education could be a fruitful area for future research (Fogarty & Else, 2005).

Conclusions

The findings of this study showed that students were overconfident when estimated their basketball dribbling performance. However, sixth grade students were more accurate compared to fifth grade students. Considering the important implications of performance calibration regarding students' motivation (Schunk & Pajares, 2009) and self-regulation (Efklides & Misailidi, 2010), interventions to improve students capability to accurately evaluate their performance are warranted.

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Increasing Elementary School Teachers' Awareness of Gender Inequity in Student Computer Usage

Nicole LUONGO *

Saint Peter's University, United States

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Abstract

This study was designed to increase gender equity awareness in elementary school teachers with respect to student computer and technology usage. Using professional development methods with a group of teachers, the writer attempted to help them become more aware of gender bias in technology instruction. An analysis of the data revealed that teachers who were exposed to gender equity professional development training sessions were more likely to exhibit gender equitable teaching behaviors than they did prior to the sessions. The data also indicated that teachers provided more equitable assistance to their classroom students after being presented with gender equity interventions.

Keywords: Technology, Gender, Bias, Elementary

Introduction

After the ratification of Title IX of the Education Amendments of 1972, America's elementary schools have been mandated to provide equal educational opportunities for both girls and boys (Shapiro, Kramer & Hunerberg, 1981). Title IX stated, "No person in the United States shall on the basis of sex be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance" (Sec. 1681). According to American Association of University Women (AAUW) Educational Foundation (1992), even with Title IX of the Education Amendments of 1972 guidelines, teachers and school administrators often struggle with the law and its regulations.

This study examined the attitudes of teachers regarding gender and technology in the elementary school. Title IX of the Education Amendments of 1972 produced parameters that

* Nicole Luongo, *Saint Peter's University*, 2641 John F. Kennedy Boulevard , Jersey City, NJ 07306, United States Phone: +12017616187. E-mail: nluongo@spc.edu.

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educators are required to follow help prevent gender discrimination (AAUW Educational Foundation, 1992). The study connected those boundaries to the fields of technology and technology education in a school in the state of New Jersey. The school involved in this study is a public institution located in a suburban middle-class section of northern New Jersey.

Statement of the Problem

The problem that this study addressed was that primary-level teachers in the school district were not providing equal or equivalent technology experiences to both genders. Previous research (Sanders, Koch & Urso, 1997) suggested that male and female students are on the same level in terms of technology ability and usage until middle school but, thereafter, the abilities of male students surpass that of the female students. This study, therefore, examined whether teacher attitudes from the primary years had any effect on the computer usage of boys and girls in elementary school.

Through informal interviews, the writer found that the teachers in this elementary school agreed that primary-level teachers in the school district did not provide equal or equivalent technology experiences for both genders. Several of the teachers admitted that they often favored the male gender in using educational technology.

Furthermore, several teachers found that even as early as elementary school, the girls did not choose to use computer technology in school projects as often as did the boys. Some of the participating teachers claimed that the female students selected traditional methods of learning and research over technological approaches because they did not have as much access to or experience with computer technology as did the male students.

The study was conducted in a kindergarten to Grade 8 school district located in a suburban, middle class section of New Jersey. The town has a population of 6,473 individuals (U.S. Census, 2000). Of these individuals, 49% are male and 51% are female. At the time of this study, the socioeconomic status of the average resident was middle class with 74.9% of the residents in the U.S. work force.

In the school district, there is one elementary school that accommodates prekindergarten through third-grade students and one middle school that provides educational services to fourth-grade through eighth-grade students. At the time of the study, there were approximately 615 students enrolled in the school district with 290 in the selected school.

The two schools in the school district have been wired for the Internet. In fact, all classrooms have Internet access and are equipped with at least two computers for student use. An underground fiber-optic line connects the two schools and the administration building. The school district encourages teachers to incorporate the use of technology into their instruction; the teachers are often provided with professional development opportunities to successfully infuse technology into the curriculum.

When this study was conducted, the school district staff consisted of 60 teachers, 1 superintendent, 1 middle school principal, 1 elementary school principal, 1 library media specialist, and 1 technology coordinator. The library media specialist did not teach computer technology. The technology coordinator worked 4 days a week and provided computer instruction for the second- and third-grade classes. There was 1 full-time technology teacher who provided computer instruction to all fourth- to eighth-grade students.

The purpose of this project was to increase teacher gender equity awareness levels with respect to student computer technology usage. Additionally, the writer aimed to help teachers become aware of gender bias in technology instruction and to provide a more gender equitable approach to technology usage.

The administration of the school district and the school district's technology committee argued that the abovementioned technology improvements allowed teachers to provide all students with an equitable high-quality technology education. Moreover, the administration provided much encouragement to teachers who participated in technology training and implemented its use into their teaching. The administration urged teachers to use technology in their teaching, but it was not obligatory. With these accessible technological opportunities, teachers should have been able to provide equal or equivalent technology educational experiences to all students--but were they? The writer's purpose in this project was to increase the teacher gender equity awareness to meet these goals.

Research Questions

This study examined several gender and technology-related questions. These questions guided the study, and were reviewed and reevaluated during the course of the study:

1. Did the teachers and students perceive that all students had equal and adequate access to the classroom computers?
2. What were the teachers' attitudes regarding gender and educational ability?
3. Did the teachers' attitudes regarding gender correlate with the provisions they made for technology use in their classrooms?

Methods

The study involved a general group of 20 elementary school teachers, some of whom were later selected as a sample group of teachers who were directly involved in the study. It also involved the 80 elementary school students from the classes of the participating teachers. The selected group of teachers was identified by means of a preliminary questionnaire. After the 20 teachers completed the questionnaire, the writer randomly chose one teacher from each grade level in the school from kindergarten through third grade by placing the names into a pool and choosing them without preference. In Table 1, the number of students in each of the selected teachers' classes is displayed.

Table 1. *Number of Students From the Selected Teachers' Classes*

Teacher	*No. of students*
Kindergarten	19
Grade 1	18
Grade 2	23
Grade 3	20

The target population for the study included all teachers in the school (Gall, Borg & Gall, 1996). The study then utilized an *accessible population,* which was a practical option of using individuals who could realistically be included in the sample. The general group of teachers was classified as those teachers who replied to the initial questionnaire. Gall et al. explained that a *convenience sample* is a group of cases that are selected simply because they are available and accessible. A convenience sample group of four teachers was selected from within this general group, which became the selected sample group of teachers for the study.

The student population included all of the students in the classes of the selected sample group of participating teachers in the study. In order to choose students for the focus groups, the writer randomly selected students from the population by using a systematic sampling procedure. A list of all students in the population was created. Then, the population of students was divided by four, which was the number needed for the sample (Gall et al., 1996). Next, the writer selected the students and distributed permission slips to them. The permission slips were photocopied and handed to the children's homeroom teachers to be distributed. All of the children in the selected classes returned the permission slips. The children who returned the permission slips were placed into a group of participants.

Instrument

The quantitative research measure that was used in this study was the questionnaire, and was accompanied by a cover letter. The purpose of the questionnaire was to obtain information about all the teachers in the school, their technology backgrounds, and their views of gender and technology.

The study included one computer laboratory observation of the selected sample group of teachers and their students before the intervention and one after the intervention. The school computer laboratory was the location of each observation during the teacher's scheduled technology period. The writer measured the amount of time the teachers spent with girls and with boys in connection with computer technology education.

During these observation periods, the writer acted as a complete observer and maintained what Gall et al. (1996) called "a posture of detachment from the setting being studied"(p. 345). Structured observation methods were used to observe specific behaviors of the teachers regarding their treatment of the boy and girl participants. The writer used a quantitative, tailored observation system (Glickman, Gordon & Ross-Gordon, 1995) designed to collect these four specific types of behaviors:

1. How often the teacher assisted male students.
2. How often the teacher assisted female students.
3. How often the teacher provided positive feedback to male students and female students.
4. How often the teacher provided negative feedback to male students and female students.

An example of the observation instrument can be viewed in Figure 1.

The writer used this set of data to examine the patterns of the selected teachers in relation to their interactions with male and female students and their technology teaching behaviors. The data by analyzed by tallying the total number of instances of assistance to the female students and the total number of instances of assistance to the male students. The number of positive responses given to male students and compared that number to the number of positive responses given to female students were tallied. Likewise, the writer distinguished between the number of negative responses given to male students and the number of negative responses given to the female students. The analysis included a gender comparison of these variables.

B +++	G	B
B ---	G	G +
B ---	B	B
B ++	G +++	G
G ----	G +++++	G
B	B --	B
G	B ++--	G

Figure 1. Question-response observation instrument for measuring gender bias. B = boy, G = girl, = teacher assistance to student, - = positive response to student, + = negative response to student.

Additionally, the writer conducted individual semistructured confirmation survey teacher interviews with the four selected teachers before and after the intervention. An interview guide was used and, although it was structured, the interviewer was prepared to make any necessary modifications if the interview did not go as planned.

Furthermore, the writer used focus group interviews to examine student perceptions of gender equity in their teacher's instructional methods. The writer conducted four sets of focus group interviews. Each group was interviewed before and after the intervention.

Throughout the study, the writer monitored the four selected teachers in the computer laboratory completing the preintervention observations. The writer met with each participant before the observations to discuss appropriate observation times. The tailored question-response observation instrument for measuring gender bias was used to collect data on the gender-biased behaviors (see Figure 1).

Additionally, the writer interviewed each teacher and conducted the student focus groups at convenient times and places. After collecting the initial data, an action project was implemented in which the writer worked with the four selected teachers to promote gender equity in technology education. Rubin (2000) discussed certain strategies that could be used to transform attitudes toward gender stereotypes and behavior through school programs. There were three goals of the teacher intervention strategies:

1. To learn about gender neutral teaching strategies.
2. To learn about ways computers could support and enhance student learning.

3. To consider ways to use the available computer resources equitably in their classrooms.

Research (Lundeberg, 1997; Sanders, 2003b) documented intervention strategies that include the presentation of gender equity sessions. Four after-school workshops were conducted. Sanders explained that a one-shot workshop by itself is unlikely to do much. For the workshop to be effective, it must have a follow-up. Follow-ups can include multiple workshops and specific activities that occur as a result of the workshop.

When creating a gender equity workshop, Sanders (2003b) suggested using six rules: (a) prepare extensively, (b) be factual, (c) use no blame, (d) do not bash males, (e) demonstrate support, and (f) remember the What's In It for Me? rule. Sanders explained that the workshop must be relevant to the participant's concerns and it must demonstrate that there is a gender problem that needs to be addressed. Because a problem was established in the pretesting phase of the study, the writer was able to present this finding at the workshop.

During this time, the writer conducted four after-school gender equity sessions with the four selected sample group of teachers. These sessions presented gender equity and technology information to the teachers in order to improve their knowledge of gender equity and technology education.

After the intervention strategies were completed, the outcomes of the project were evaluated by reevaluating the attitudes of teachers and students. The questionnaire was administered to the general group of teachers, and compared the original questionnaire results with that of the subsequent one. The writer looked for a change in the responses of the participants.

The follow-up computer laboratory observations were conducted in the computer laboratory. The writer observed the selected sample group of teachers. The writer and teachers decided on appropriate observation times and discussed what lessons would be occurring during those time periods.

Additionally, the writer interviewed the selected sample group of teachers and students to see if they perceived a change in the teacher attitudes. During the interviews, the same questions in the initial interview were asked. The writer compared these findings to the initial results to see if a change had occurred.

Results & Discussion

The purpose of this study was to increase the study participants' awareness of gender-related issues in association with technology. The pretesting results had indicated that the teachers in the school district were not providing equal or equivalent technology experiences for both genders. In order to remedy this situation, the elementary school teachers were exposed to several gender equity intervention strategies. Based on follow-up interview and observational data, the intervention strategies had proved to be successful. It was found that the participating teachers in this study from all of the grade levels had made the effort of distributing equitable attention to the boys and girls. They understood the impact that their attitudes and behaviors regarding gender could have had in their classrooms and computer laboratories. In this study, several gender and technology-related questions were examined. The questions were divided into three main areas of interest: (a) technology access, (b) teacher attitudes regarding gender and technology, and (c) technology provisions and gender.

Technology Access

Three questions were asked on technology access:

1. Did the teachers and students perceive that all students had equal and adequate access to the classroom computers?
2. What were the teachers' attitudes regarding gender and educational ability?
3. Did the teachers' attitudes regarding gender correlate with the provisions they made for technology use in their classrooms?

The teacher questionnaire, the teacher interviews, the student interviews, and the intervention session discussions provided the data with respect to these questions. These data-gathering techniques allowed the writer to obtain information in a variety of ways to see if the verbal and written reactions corresponded with the actions of the teachers in the study. They provided an insight to the question of the student perceptions of technology access matching the teacher perceptions.

The general group of teachers who responded to the questionnaire and the selected sample group of teachers seemed to hold similar views at the initial data collection point. On the whole, the majority of the teachers in these two groups claimed that they were not satisfied with the amount of time given to technology use and the computer laboratory.

The teachers in the general group produced a variety of reasons why they were dissatisfied with the amount of time given to the use of technology. A first-grade teacher explained that the lack of use technology as much as was due to pressures and responsibilities of teaching. Another teacher explained there were not enough computers in the school for those students to have access when they were needed. A second-grade teacher claimed, "When I want to get into the lab, the schedule is usually full. Also, the computers and printers in my classroom are often broken and the help does not get here quick enough." One third-grade teacher contended that "there is not enough time in the day" to get all the students on the computers. Another third-grade teacher maintained, "I do not get to use the computers as much as I would like to. I just do not have enough time to use them."

Likewise, the selected sample group were displeased with the amount of time spent on technology. The kindergarten teacher claimed, "I would like to use the computers more with the children. It is very difficult to get my students logged on to the computers in the lab by myself; the children are just learning to spell their names." The first-grade teacher asserted, "I would love to have a formal computer class taught by a computer teacher." The third-grade teacher stated that that class did not get into the computer laboratory as much as is desirable.

On the other hand, there were several teachers in the general group who were content with the amount of time they spent using technology in the classroom and the computer laboratory. One third-grade teacher explained that "the students get 40 minutes of instruction and 30 minutes of practice," which that teacher claimed was enough time for those students. A first-grade teacher claimed having a belief that the additional time the technology director assigned for using the computer lab furnished adequate time for using technology.

Only one teacher in the selected sample group perceived satisfaction with the amount of time used in technology. The second-grade teacher maintained, "It does not dictate or control my lessons, but it adds to the learning." Regarding the computer laboratory, the same teacher explained, "There is so much to do in my classroom that for now, it allows me

to do what I want to do." That teacher explained that the technology adds to the class lessons, but is not necessary to all of that teacher's goals.

Many of the views and attitudes of the general group and selected sample group changed regarding technology after the intervention sessions were conducted. Although the general group of teachers did not take part in the intervention sessions, they did experience certain changes. These changes were focused on common technology issues, not necessarily gender issues. The selected sample of teachers took part in the intervention sessions, and experienced evident changes in their opinions specific to gender and gender equity.

The changes in the general group's opinions after the intervention sessions focused on common technology usage issues. A first-grade teacher from the general group explained that that teacher started using the interactive whiteboard in class lessons due to the professional development training that the school provided. Another first-grade teacher agreed that the training received from workshops has made that teacher more comfortable using the technology. A third-grade teacher explained that having an assigned time in the computer lab motivates the teacher and the students. Most of these teachers did not mention gender equity issues in their postintervention responses.

After the intervention sessions, the selected sample group's view changes were directed towards gender equity and technology access. The second-grade teacher in the sample group asserted, "I started using the lab more often this year because it was necessary to get all the kids on the computers." That teacher explained that all girls and all boys needed to get more access to technology through the process of this study. The first-grade teacher expressed an awareness of the gender inequity in the classroom. The third-grade teacher was interested in following up by making sure the future technology classes of that teacher were provided with equitable time and access.

During both rounds of student interviews, most of the students perceived that they did not have equal access to the computer. However, a single reason was not apparent. Each group of students gave a different reason why they did or did not have equal access to technology. The kindergarteners believed that the students who finish their morning snacks were the most likely ones to use the computers. The first-grade boys believed that their teachers got to use the computers the most of the time; the first-grade girls said it was equal within the class. Three of the second graders claimed that there was a specific male student who made use of the computers the most. One of the students explained that that male student needed remedial help. Although the third graders perceived that they were able to use technology equally, they were unable to give any reason for this explanation.

There was a correlation between the selected sample group of teachers' and students' views of technology access. On a whole, the teachers believed that they did not have sufficient access to technology. Likewise, the students did not feel they had enough access to technology. However, the percentage of students who were displeased decreased after the intervention sessions were completed. In the preintervention interviews, 69% of the students in all grades did not believe they had enough access to technology. In the postintervention interviews, the number of students decreased to 56% of students who believed they did not have enough access to technology.

Teacher Attitudes Regarding Gender and Technology

There were three questions asked concerning teacher attitudes on gender and technology:

1. Did the teachers and students perceive that all students had equal and adequate access to the classroom computers?

2. What were the teachers' attitudes regarding gender and educational ability?
3. Did the teachers' attitudes regarding gender correlate with the provisions they made for technology use in their classrooms?

The questionnaire, the teacher interviews, and the intervention session discussions collected information about the teachers and their attitudes about gender and gender bias. The initial and follow-up questionnaire results provided data regarding the teacher levels of perceived gender bias at both the preintervention and postintervention sessions (Best & Kahn, 1993). The teacher responses in the questionnaire provided the writer with data to rank them as possessing high, moderate, or low levels of perceived gender bias. Overall, the sample group of selected teachers involved in the intervention showed more of a change of attitude in terms of perceived gender bias than the general group.

Although some of the teachers involved in the intervention sessions initially claimed that their classes were free of gender bias, they discovered and admitted they were surprisingly mistaken. Through the discussions and activities that occurred during the intervention phase of the study, the selected sample group of teachers realized that they did possess certain gender biases that they exhibited in their classrooms and the computer laboratory. They claimed that they often provided more assistance to the boys for a variety of reasons. The most popular reason given by the teachers during the interviews and informal discussions was the aggressive nature of boys. The teachers explained that boys often call out more often and seek assistance from the teacher; the girls are more passive and wait for the teacher to approach them.

The results of the preintervention computer laboratory observation of the selected sample of teachers can be viewed in Table 2. The writer collected data on the number of male and female students as well as the number of times the assisting teacher gave positive or negative responses to each gender. The writer calculated the results to show the total number of assists for each gender, which can be seen in Table 3.

Table 2. *Computer Laboratory Preintervention Observation Data*

Category	Kindergarten	Grade 1	Grade 2	Grade 3	Total
No. of students					
Girls	9	6	10	9	34
Boys	10	11	10	13	44
Teacher assistance					
Girls	8	10	17	1	36
Boys	19	15	20	11	65
Positive responses					
Girls	1	2	3	1	7
Boys	11	3	8	3	25
Negative responses					
Girls	0	1	0	7	1
Boys	1	7	7	5	20

At the conclusion of the intervention sessions, the writer observed the selected sample group of teachers in the computer laboratory. The writer collected data with respect to the

number of male and female students and the number of times the assisting teacher gave positive or negative responses to each gender. The results of the postintervention observation can be seen in Table 4. After tabulating the initial data, the writer calculated the results to show the total number of assists for each gender (see Table 3).

Table 3. *Total Number of Preintervention and Postintervention Responses by Gender*

	Responses of the girls		Responses of the boys	
Category	Preintervention	Postintervention	Preintervention	Postintervention
Kindergarten	9	31	27	26
Grade 1	13	25	32	34
Grade 2	20	35	15	17
Grade 3	2	19	19	21
Total	44	110	93	98

The intervention sessions that were conducted with the selected sample group of teachers presented information that added to the development of conclusions to the study. All of the computer professional drawings that the teachers created during the intervention sessions were of women. The students' drawings contained both female and male computer professionals. In Table 5, the division between male and female computer professional student drawings by grade level is provided. The drawings were divided according to gender; the teachers discussed specifics of what their children drew and the reasons behind the drawings.

During the second intervention session, the writer shared the data that was obtained from the computer laboratory observations (see Table 2) with the selected sample of teachers. The teachers and the writer discussed the statistics as well as the reasons behind the results. This meeting provided all teachers present with an opportunity to collaborate and examine the data.

Table 4. *Computer Laboratory Postintervention Observation Data*

Category	Kindergarten	Grade 1	Grade 2	Grade 3	Total
No. of students					
Girls	9	7	10	9	42
Boys	11	10	10	11	35
Teacher assistance					
Girls	12	18	7	8	45
Boys	11	22	8	8	49

Table 4 (Continue). *Computer Laboratory Postintervention Observation Data*

Category	Kindergarten	Grade 1	Grade 2	Grade 3	Total
Positive responses					
Girls	9	8	5	5	27
Boys	5	7	5	4	21
Negative responses					
Girls	6	6	3	6	21
Boys	10	5	4	9	28

During the third intervention session, the selected sample of teachers claimed to have had difficulty finding pictures of women using technology. The third-grade teacher found one picture of a woman using a cell phone; the second-grade teacher presented two pictures from a women's magazine with a woman using a laptop. The other teachers found no pictures. Collectively, the teachers agreed that the majority of technology advertisements and pictures in the media were focused on male consumers. Furthermore, this session's activity presented some information on how the teachers viewed girls and boys. The results of the activity can be seen in Table 6.

During the teacher interviews, the participating teachers were asked to describe the boys and girls in their classes using two adjectives. The descriptions the teachers in the study used to generalize the behaviors of students in their classes can be viewed in Table 7.

Table 5. *Division of Male and Female Drawings*

Teacher	Male	Female	Both
Kindergarten	14	3	1
Grade 1	5	11	0
Grade 2	6	9	0
Grade 3	10	30	1

Note. Total drawings of females were 35 and of males were 30; 1 drawing had both.

Technology Provisions and Gender

In addition to the questions regarding technology access, there were three questions dealing with technology provisions and gender:

1. Did the teachers and students perceive that all students had equal and adequate access to the classroom computers?
2. What were the teachers' attitudes regarding gender and educational ability?
3. Did the teachers' attitudes regarding gender correlate with the provisions they made for technology use in their classrooms?

From the completion of the questionnaire and the teacher interviews, information was collected about the teachers and the provisions they made for technology use. The student interviews and computer laboratory observations provided supplementary information for analysis.

Table 6. *Description of the Gender Description Activity*

Age	Descriptions of males (John)	Descriptions of females (Jane)
Infancy	Influenced by Mom. Plays with balls and trucks.	Influenced by Mom. Plays with dolls and bottle.
Nursery school	Influenced by Dad. Plays with blocks. Wears blue, green, or brown.	Influenced by teacher. Plays with Barbie. Wears a skirt
Elementary school	Influenced by Dad, teacher, and Mom. Draws, reads, and plays games. Wears whatever parents buy.	Influenced by friends and teacher. Reads and draws. Wears a skirt.
High school	Influenced by friends. Plays sports and with video games. Wears sweatpants.	Influenced by friends. Interested in jewelry. Wears a skirt.
College	Influenced by Mom, Dad, friends, and girlfriends. Plays with video games. Wears sweatpants.	Influenced by friends (boys and girls), and boyfriends. Interested in socializing. Wears a skirt.

Initially, the majority of both the general group of teachers and the selected sample group of teachers claimed that they provided equal or equivalent technology provisions for all students in their classrooms. The general group of teachers believed that gender did not play a part in their behaviors in the classroom. A second-grade teacher explained, "They use the computer when we go to the lab. There are no special provisions made for boys or girls." A first-grade teacher asserted that the children all had equal access to the technology in that room as well as the school. Many of the teachers claimed to have a procedure for assigning children to classroom and computer laboratory computers.

Table 7. *Teachers' Preintervention and Postintervention Description of Boys and Girls*

Category	Description of boys	Description of girls
Kindergarten		
Preintervention	Active an loud	Calm and sensitive
Postintervention	Talkative and active	Caring and kind
Grade1		
Preintervention	Loving and physical	Loving and centle
Postintervention	Loud and lively	Organized and calm
Grade 2		
Preintervention	Rowdy and loud	Quiet and worriers
Postintervention	Bright and enthusiastic	Obedient and interested
Grade 3		
Preintervention	Loud and rambunctious	Quiet and calm
Postintervention	Talkative and louder	Sensitive and quiet

Similarly, the selected sample group of teachers believed that they provided equal or equivalent provisions for boys and girls in their classes. The kindergarten teacher stated, "The children use the computers when we all go into the lab. They also rotate on the computers in

the classroom." The selected first-grade teacher agreed, adding that the children in that room followed a certain procedure that permitted them to take turns on the computers in the room.

During the preliminary round of interviews and questionnaires, the general group of teachers documented a variety of ways of how they selected children to use the computers in the classroom. One second-grade teacher explained the use of an alphabetical list of the students' names; the teacher checked off each name as each student used the computer. In first grade, two of the teachers asserted that the students used the computer to type their morning writing journals. Another first-grade teacher explained that teacher's procedure, "I use a new class list everyday. The student highlights his name when he begins a session of the software. Everyone has a turn." Several teachers maintained that students who required extra help used the computer to engage in educational games or certain software.

Likewise, the selected sample group of teachers acknowledged how they selected children to use technology in the classroom. The selected second-grade teacher explained that a rotating schedule had been set up in that classroom. The third-grade teacher maintained that students who finished their work were permitted to use the computer. The kindergarten teacher explained that the children used the computer during center time and free time.

Some of the teachers in the general group explained that it was difficult for all students to get equal time due to individual circumstances. One teacher claimed that students circulated through that classroom at different times. That teacher explained that this movement hindered the ability to ensure equal time to all students. Another teacher did not keep track of students on the classroom computers; they were allowed to use the computers when they were finished with other work. That teacher expressed concern over this inequality, but claimed to not know how to make it more equitable. The teachers in the selected sample group did not express difficulty in providing equal time to all students.

During the first round of interviews, none of the teachers in the selected sample believed that their attitudes about gender affected their students' beliefs. The participating second-grade teacher explained that attempts were made to be as fair in classroom as possible, but no matter what the attempts, the students used the computers at their own paces. This same teacher did not see any reason how the style of teaching the class could affect how the students perceived themselves. On the other hand, the kindergarten teacher was concerned not only with the way that the children were taught, but by the number of boys and girls in each class. That kindergarten teacher contended that when there were more boys than girls in a class, the focus turned to the boys. That teacher also believed that the girls were more likely to find alternate solutions when using the computers rather than asking the teacher. A first-grade teacher claimed that the class technology allotment was fair, but acknowledged that not every student used the computer daily. However, that first-grade teacher believed that it did not any affect how students perceived using technology or themselves.

During the computer professional drawing activity in the intervention session, all of the computer professional drawings that the teachers created during the intervention sessions were of women. The writer and the teachers discussed the reasons why they drew women. They explained that they thought of the school technology director who is female as well as other computer professionals that they knew. One of the teachers described a former roommate who was a computer technician. The group discussed the details of the drawings and concluded that in the past they would have probably drawn men. More recently, women have emerged as computer professionals. The writer concluded that the teacher views of gender were changing due to the strong emergence of women in the technology field.

The data that the writer collected regarding the students' computer professional drawings (see Table 5) was divided according to gender. During the second intervention session, the teachers discussed specifics of what their children drew and the reasons behind the drawings. The findings suggested that the students in these grades did not hold a strong view of a certain gender holding the profession of computer professional. Furthermore, there was no established difference between the boys' and girls' drawings.

The computer laboratory observations provided information about the teachers' behaviors towards using technology. This setting provided each student with an equal opportunity to use a computer. There were enough computers in the laboratory for each student to have access. The writer used the observation tool in Figure to track the number of times each teacher assisted the boys and the girls. In the original observation period, the teachers provided a total of 44 responses to the girls and 110 responses to the boys. In the follow-up period, the teachers provided a total of 93 responses to the girls and 98 responses to the boys. These numbers indicated that there was reduction in gender bias in the classroom.

During the intervention sessions and teacher interviews, the selected sample group of teachers discussed the behaviors of both boys and girls. The first-grade teacher explained that the boys are often more verbal about their needs, both in using technology and in other aspects of the classroom. The second-grade teacher claimed that girls will often sit and wait patiently while the teacher assisted the boys first. Throughout the intervention sessions, the teachers discussed that they were more aware of these aggressive male behaviors.

The follow-up interviews presented similar explanations for how the selected sample group of teachers delineated technology time among students in their classrooms. Most of the teachers had created or modified a procedure for students to follow in order to use computers. Some of the teachers mentioned that they were attempting to be less gender-biased in their educational technology approaches.

The general group of teachers noted some frustration with securing a successful system in providing equal opportunities for all students. One third-grade teacher explained, "I have students coming in and out of my room for a bunch of reasons. When they are not in my room all day, it is hard to fit in time for them to be on the computer." A second-grade teacher claimed, "I have not found a way to guarantee that all students have equal access to the computers."

After the intervention sessions were completed, the selected sample group of teachers' views and attitudes regarding gender changed. The general group did not change as dramatically. The selected first-grade teacher explained that there was an increased awareness of how personal attitudes and behaviors affected the children in the class. That first-grade teacher also noted the lack of female images in children's software as well as technology in general. The selected third-grade teacher explained that attempts had made to provide more equitable assistance and support to both the boys and the girls. That teacher also believed that if the school provided more computers, the students would have more access in general. Above all, all of the teachers who were involved in the professional development sessions noted a change in attitude toward gender and technology.

Based on the results of the second round of teacher interviews and questionnaires, the teachers agreed that all students, both male and female, had more equal access to technology than they did before they went through the professional development sessions. The teacher levels of awareness of gender equity were higher than they were before the intervention sessions. Some of the participants explained that they modified their selection procedures to be more gender equitable. One first-grade teacher acknowledged that classroom procedures and assistance attempts were meant to be fair, but that teacher could

now see how bias had been present in certain ways. The third-grade teacher agreed to use the tips that received during the training when planning for next year. Moreover, the teachers discussed how the aggressive nature of the boys as well as other factors can contribute to the unequal distribution of attention to the male students. Others found that their procedures were gender equitable and planned on continuing them.

In addition to the teacher attitudes, the writer examined the student attitudes towards the teachers who taught them. The writer used the student interview data to support the information that was gathered from the teachers. The writer examined several questions. How did girls and boys view technology? Did the students perceive that they all had equal access to the classroom computers? Why or why not? To answer these questions, the writer used the student group interview data.

The 16 students involved in this study viewed technology in a variety of ways. The preintervention interviews provided a base of what the students knew about technology and its connection to computers. The writer categorized the responses as ones that mentioned the term *computer* and ones that did not mention the term. During the preintervention interviews, 31% of students mentioned the term computer. When asked about technology, the kindergarteners and first graders were unsure of a definition for it. When asked what technology was, some of the students simply did not know; the others mentioned light. The second graders named some familiar forms of technology, such as computers, lights, cell phones, and other technologies. The third graders also named common forms of technology.

The percentage of students who referred to computers increased to 63% during the postintervention interviews. The follow-up interviews showed that the students were more aware of technology and its connection to computers. The majority of the student subjects in all grades acknowledged technology was related to computers. Some mentioned cell phones and lights, but the most common response for this section was computer-related.

In terms of whether or not they perceived themselves as having equal access to technology in the classroom and computer laboratory, the writer examined their responses to the interview question regarding who had the most access to technology in the classroom. The responses were coded in terms of whether they referred to a specific group or referred to the students being able to access technology in a fair and equitable manner. During the preintervention interview sessions, 31% of the students believed that they received equal access to technology. After the intervention sessions, 50% of the students perceived that they were provided with equal access to technology. Although some of the responses discussed other students, many of the replies focused on the teacher and how the teacher used the computer the most in the classroom.

Implications of Findings

Several implications can be made regarding teacher attitudes and perceptions of gender and technology. In this section, the same topics and questions that were presented in the previous chapter were focused upon: (a) technology access, (b) teacher attitudes, and (c) technology provisions.

One finding of the study was that neither the general group nor the selected sample group of teachers involved in the intervention was satisfied with the amount of time given to technology in the classroom or the computer laboratory. Both groups of teachers provided various reasons for why they were not satisfied. These reasons included time, space, lack of knowledge, and system requirements. Additionally, both the general group and selected

sample group of teachers who participated in the intervention showed changes in attitudes and perceptions on general technology usage during the study.

Although the study did not directly influence the number of computers present or the teacher access to the computer laboratory, both the general group and selected sample group of teachers claimed to be more satisfied with the amount of time they spent using technology at the end of the study. The reasons included (a) general professional development training sessions, (b) a higher number of computers present in the classrooms, and (c) more access to the computer laboratory. The technology coordinator explained that, during the course of the school year, there were several technology improvements that occurred in the school district. These upgrades included the addition of more computers in the classrooms and computer laboratory as well as the purchase of interactive whiteboards. Additionally, several technology training sessions for the teaching staff were also held.

The writer also found that the selected sample of teachers involved in the intervention believed that all students had more equal access to technology than they did before they had gone through the professional development sessions. Mainly, the teachers explained that the intervention sessions made them reconsider their gender biases as well as other biases and reconstruct how they provided student access to the available technology.

However, this finding did not isolate gender as the only variable in the increase of student access to technology. The general group and selected sample group of teachers explained that the increase in equity correlated with the fact that the teachers were more confident using technology, thereby, giving them the option to use it more in their teaching methodology. The teachers cited professional development opportunities and more practice opportunities as reasons behind their increased comfort using technology and infusing it into their teaching. The teachers explained that this ability to integrate technology into the curriculum provided more access to all students, not just boys or girls.

Additionally, the writer found that while many of the students perceived that they did not have equal access to the computers, gender bias was not the main reason behind the student perceptions of their teachers. They claimed the inequality related to areas, such as academic ability, speed in finishing work, and other factors. The student views towards their teacher's attitudes and perceptions did not seem to change after the intervention sessions were implemented. The view was the same for both boys and girls. However, this finding may have been skewed due to the young ages of the children involved in the study. Many of these children may not be developmentally prepared to comprehend their teacher's gender biases. The children viewed the access they had to computers and other forms of technology as not being correlated with their teacher's levels of gender bias.

The results of the questionnaire distributed at the beginning of the study showed that neither the general teacher group nor the selected sample group involved in the intervention were satisfied with the amount of time and training they received on the topic of technology. The results at the end of the study showed that there was a difference between the general teacher group and the selected sample group involved in the intervention in terms of the changes in attitudes and perceptions of gender and technology.

The selected sample group of teachers acknowledged that there were general similarities between the boys and girls in their classes. The first-grade teacher from the selected sample group asserted that both boys and girls were sensitive, inquisitive, anxious, loving, caring, and helpful. They also seemed eager to learn, but lacked patience and control. The second-grade teacher claimed that boys and girls both "love to come to school. They love to read and be read to. They like to draw pictures." The third-grade teacher claimed that boys and girls were similar in their math ability, but did not comment on their other abilities.

Conversely, the selected sample group of teachers identified that girls and boys had different qualities. The kindergarten teacher stated that girls tend to be more reserved in their responses while the boys are more outspoken. The first-grade teacher explained that boys tend to be more physical and aggressive. The second-grade teacher thought that the boys were more excited to use the computers than the girls. The third-grade teacher acknowledged that the children may possess equal academic skills, but often show different behaviors when working academically.

The selected sample group of teachers expressed some differences in the manner in which boys and girls utilized technology. The first-grade teacher saw that the boys wanted to play games on the computer while the girls enjoyed drawing and writing using a variety of educational software programs. The third-grade teacher observed that the boys tend to use sports games while the girls play games that deal with academics. The third-grade teacher explained that when there are more boys, that teacher tended to help them more frequently with academic tasks.

When the selected sample group of teachers was presented, during the second intervention session, with gender equity and technology statistics from earlier studies, they voiced concern about the dates of the study. The teachers discussed how they believed the statistics were outdated because women were then-currently being viewed as more acceptable in the world of technology. The writer discussed the years of the statistics and how things have revolutionized. The teachers agreed with the change, citing the fact that the main computer teacher and the main technology director in the school district were both female. The teachers agreed that females have made much progress in the field of technology. Moreover, the teachers predicted that females will become more prominent in the field in the future in the world of technology.

As a result of the intervention, the writer found that the selected sample group of teachers recognized to their surprise that they had held certain gender biases that they demonstrated in their classrooms and the computer laboratory. During the study, the attitudes and perceptions of the selected sample group of teachers had changed. Initially, these teachers claimed to teach in a gender equitable manner. After the intervention, they recognized and admitted that they did possess some gender bias in regards to technology.

With regard to the changes in attitudes and perceptions of gender and technology, there was a distinction between the general teacher group and the selected sample group that was involved in the intervention. The general group did not exhibit any specific changes in attitude regarding gender equity with the study. These teachers seemed to hold the same views of gender and technology before and after the study. Their unvarying attitudes could be attributed to the fact that they were not involved in the gender intervention sessions.

On the other hand, the selected sample group demonstrated identifiable changes in attitudes and perceptions of gender and technology in the postintervention data collection procedures. The general group's postintervention questionnaire responses were similar to the ones in the preintervention questionnaire. The selected sample group of teachers focused more specifically on gender as a construct in correlation with technology attitudes.

In the preintervention observation of the kindergarten class, there were three boys who received most (19) of the 31 responses. These three individuals received teacher assistance and positive responses. The teacher provided responses to 10 of the 11 boys; the teacher provided responses to 3 of the 8 girls. During the postintervention, all of the children except for one girl received responses. There were no students who seemed to receive more attention than others.

The preintervention observation of the second-grade class showed that there was 1 boy who received 8 of the 35 responses and 1 girl who received 7 of the 20 responses. These 2 students received teacher assistance and positive responses. The teacher provided responses to all of the boys, but did not respond to 3 of the 10 girls. In the postintervention observation, the teacher responded to all of the students and did not provide more attention to any specific individual.

The third-grade preintervention observation produced some strong evidence of teacher change in attitude in terms of gender equity. During the preintervention observation, the teacher only provided two responses in total to the girls. That teacher focused on one boy, in particular, providing six responses. The teacher provided no responses to seven girls and eight boys. After the intervention, the teacher provided responses to all of the students except for one girl. Furthermore, the teacher did not provide more attention to any specific individual. The writer concluded that the gender equity intervention was successful with the sample group as it met the objectives of the study.

Additionally, there was a pattern to the perceptions of the sample group to their own gender biases. The results showed that they were erroneous. The writer concluded that these teachers realized that they did possess some gender biases. The teachers explained that the intervention session activities had contributed to this revelation. During the second intervention sessions, the writer explained that there was a total ratio of 44 responses to girls and 110 responses boys. In response, the teachers offered several reasons behind this discrepancy. The third-grade teacher explained that there were more boys in that room. That teacher also explained the boys in the class were easily distracted, did not pay attention, and were less mature than the girls. Moreover, the third-grade teacher claimed that the boys spoke out more and questioned the teacher when they did not understand. The second-grade teacher added that the boys were often louder and did not follow instructions as well as the girls. Similarly, the first-grade teacher claimed that boys were less likely to follow the directions provided by their teacher and, thereby, needed the teacher's assistance while they were working.

The selected sample group of teachers discussed what they were presently achieving in their teaching activities that fostered gender equity and what more they could do to support gender equity in their own classrooms and in the computer laboratory. The teachers described procedures, such as setting up a rotating schedule for students to use the computer and using random selection processes of choosing names from a jar. Others claimed they do not use pink or blue to depict certain genders. However, one of the teachers admitted to often allowing the girls to be first and created lists of boys and girls for that teacher's personal records. Above all, the teachers believed that society plays a huge part in the development of role play.

In addition, the teachers expressed interest in expanding their education on both gender equity and technology issues. The teachers expressed interest in additional professional development sessions and learning opportunities as well as ongoing informal discussion between staff members and administrators.

However, the writer concluded that there were certain circumstances that could have affected the computer laboratory observation results. The behavior of the boys and girls could have factored into the results of the pretesting and posttesting observations. In both observation periods, the boys seemed more aggressive in their pursuit of help than the girls did. The writer witnessed boys waving their hands while the girls seemed content to figure out their problems on their own. Moreover, the teachers involved in the intervention agreed that the boys were more aggressive in many circumstances.

The findings suggest that there is a problem in relation to gender equity, education, and technology. Particularly, research has shown that the attitudes and behaviors of elementary school teachers regarding technology and gender equity correlate to the success of technology in the classroom. Thompson et al. (as cited in Tatar & Emmanuel, 2001) contended that gender is not considered significant to elementary school teacher training. The implications of this study showed that many of the teachers had not been aware of the problems gender inequality could cause. They had not experienced any gender equity training before the professional development sessions.

The male and female participants in the study exhibited certain gender-specific behaviors in the computer laboratory that correlate to the research available on the topic (AAUW Educational Foundation, 2000). The elementary school boys dominate computer use by crowding the girls out. The teachers in the study explained the same phenomenon happening in their classrooms. Boys were often more likely to help the teachers with technology in the classroom for a variety of reasons. Additionally, the teachers viewed the males as more aggressive and the girls as more passive regarding technology. Researchers (Gurian & Henley, 2001; Siann, MacLeod, Glissov & Durndell, 1990) agreed that the boys tend to seek out computers whereas the girls often step aside.

Moreover, this study revealed that gender equity should become systemic and should be built into teacher education programs as well as ongoing teacher professional development. Sanders (2002b) contended that this endeavor must be on the agenda of the teacher education profession as well as the college or university that is schooling the preservice teachers. The topic of gender equity should be built into education courses and curricula. Finally, the study supported the research that teacher educators need a concise program of instruction as well as materials to establish a reliable means of teaching gender equity.

These findings have further implications for the field of education. Data from this study implied that teachers who are exposed to gender equity training tend to exhibit more gender equitable behaviors than they did before the training. The data indicated that teachers provide more equitable assistance to their students after being presented with gender equity training.

Additionally, the writer advocated adopting a proactive stance in regard to gender equity education among faculty and staff members (Brusca & Canada, 1992). If schools choose to ignore, deny, or view the technological gender gap as a natural state of affairs, the gap will widen. The findings in this study indicated that schools should attempt to create an environment that provides for gender equitable technology opportunities for both the male and female students. Simply ignoring the problem will not make it go away. Brusca and Canada asserted that without intervention, the technological gender gap will only widen. Furthermore, the findings showed evidence that when educators assume a proactive stance toward ensuring gender-equitable computer opportunities, their attitudes and teaching behaviors change.

School leaders, such as principals and curriculum directors, should be aware of gender issues and matters. These concerns should be an integral part of teacher observations and evaluations. Additionally, curriculum developers and directors need to be concerned with gender issues when choosing and developing curriculum.

Limitations

This study had several limitations, delimitations, and constraints. First, the writer was limited in scope due to the sampling procedure (Gall et al., 1996). In this study, the writer used a convenience sample of elementary teachers in one school district. This specific sample was

located where the writer worked, and was not representative of the entire population. Because the study was confined to one small, suburban school district located in northern New Jersey, it was delimited to one elementary school in order to focus on the population of kindergarten through third-grade teachers.

The data collection method of using a questionnaire presented some limitations (Gall et al., 1996). First, some of the general group of teachers did not return the initial questionnaire. Some also did not return the concluding questionnaire. Moreover, some of the general group did not complete all of the questions in the questionnaire, thereby, threatening the validity of the study. Additionally, the writer trusted that the respondents were being honest and candid. Often, respondents try to respond with answers that they think the writer wants to hear.

Additionally, there were situational variables that limited the study outcomes. These conditions included variables, such as lighting, heating, and ventilation (Gall et al., 1996). These environmental variables possibly affected how the subjects responded to the interviews and the questionnaires. Moreover, the psychological and mental conditions of the subjects influenced the results of data collection.

Furthermore, the study was delimited in the scope of time required to complete the study. Although a longer time period could have facilitated a more accurate longitudinal study, the time range of the study was restricted to the school year. The selected sample of teachers was only available for this duration of time.

Recommendations

Based on the findings, conclusions, and implications of this study, the writer has several recommendations for future research and practice. First, additional research should be conducted to better understand the connection between elementary school students, teachers, gender, and technology. Research should be conducted using larger and more diverse populations. The writer suggests completing this study in both elementary and secondary school settings to see if the findings are complementary. Replication of this study with different samples and populations would confirm results that the intervention strategies lead to teacher awareness of gender issues.

Moreover, more studies regarding gender and technology should be conducted in different geographic areas. This study was conducted in a suburban school district in the northeastern area of the United States of America. It should be replicated or modified to be conducted in other areas of the country as well as in other nations. It would be interesting to see if gender issues were similar in other areas of the world. Do teachers in nations outside the United States of America place as much emphasis on gender?

The writer recommends further research regarding gender and technology using elementary school students as subjects. Although this study focused on technology in a computer laboratory, a potential study could examine gender, technology, and the classroom. Another one could look at gender, technology, and technology at home. It could investigate the connection between gender and home computer use.

The writer recommends that studies be conducted asking what teachers think the issues are surrounding gender and education. As Sanders (2005) explained, there is a glaring hole in the research on teachers and their point of view. The writer suggests further exploration into the field of gender equity education and preservice teacher training as well as continuing professional development for current teachers.

The writer also suggested asking gender equity activists to develop solutions for problems. Sanders (2005) asserted that the most "developmental work originates in the activist's belief in their ability to produce programs and materials that teachers will value and that will be effective in increasing female participation in technology" (p. 3). Activists may be able to assist educators and other individuals involved in technology education.

Additionally, curriculum developers should use the research results of this and other gender-based studies to design and develop curriculums that are less gender-biased. Particular attention should be placed on technology education, science education, and mathematics education curriculums. Lewis (1999) recommended further historical research aimed at telling the story of women in the field of technology.

Educators and administrators should devote effort and resources into developing less gender-biased instruction. This effort should include additional professional development opportunities for teachers and administrators. These opportunities should include professional development sessions designed for gender equity training. These sessions may include technology training or may simply be directed at common gender issues.

The writer also recommends structuring the physical and social environments of computer laboratories and classrooms to enhance gender equitable learning opportunities (Brusca & Canada, 1992). The physical structure of computing facilities, such as computer laboratories and classrooms, should be gender equitable. Brusca and Canada explained that many technological areas contain individual and segregated cells and conform to a masculine separation and individuation social style rather than to a feminine social style, which is characterized by personal connections and networks. The writer suggests adjusting computers and other pieces of technology in such a way that allows for more interaction among female students. Brusca and Canada suggested strategies, such as peer tutoring, team work, and computer networking, to connect people in order to reduce female interpretation of computers as isolating, nonsocial machines.

Additionally, the writer recommends more computer time for females. Because males tend to dominate computer laboratories and computer resources, providing females-only times in computer facilities and females-only computer classes could reduce gender bias in schools (Brusca & Canada, 1992).

Software developers should also use the results of gender-based studies to cultivate less gender-biased software programs. Inkpen (1997) alleged that many computer games are designed by men for the young male market. Moreover, gender biases are found in these games, which often involve violence and use women as objects to be rescued (Provenzo, as cited in Inkpen). Inkpen recommended that additional research be conducted on how to effectively design and use educational multimedia in a learning environment without gender bias.

Additionally, advertisers should consider gender when promoting technology products. They should aim to have an equal representation of men and women in advertisements. Although there are more females in advertisements at the time of this study, they contain images of women in novice or helpless roles. Moreover, women are portrayed in a passive manner, suggesting they have limited or no computer ability.

Above all, the profession should focus more closely on gender equity issues while developing educational resources. This concentration is particularly important for technology teachers and coordinators, many of whom have relatively little formal training in gender education. Continued professional development can assist in resolving this inadequacy.

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The impact of national standards assessment in New Zealand, and national testing protocols in Norway on indigenous schooling

Kamil ÖZERK *
University of Oslo and Sami University College, Norway

David WHITEHEAD
University of Waikato, New Zealand

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Abstract

This paper first provides a critic of the implementation of compulsory national assessment protocols internationally, and then nationally through a review of the implementation process used for the introduction of National Standards in New Zealand, and National Testing in Norwegian mainstream schools. It then reviews the impact of these two assessment regimes on indigenous Māori and Sámi - medium schools in the context of historic policies of marginalisation and assimilation. Finally, it notes the crucial role of each national government in securing funding for the production of culturally responsive National Standards and National Testing in the effort of both indigenous groups to protect their languages and cultures.

Keywords: Māori, Sámi, national assessment, cultural responsiveness

Introduction

> *[Negotiating National Standards] - it's about protectionism. It's about cultural fragility and a social conscious that goes beyond an educational one. (Rau, 2010, personal communication with the second author).*

A The impassioned statement by Rau[1] embodies the key thematic thread that runs through this paper. It epitomises the ethos of the Māori-medium national standards planning team that she lead and of the many people who have lobbied on behalf of Sami for culturally responsive National Testing (NT). The advent of NT in Norway and National Standards (NS) in

* Kamil Özerk, Department of Educational Sciences, University of Oslo, Postboks 1092 Blindern 0317 Oslo Norway, Phone: +47-22855347; FAX: +47-22854250 E-mail: Kamil.Ozerk@ped.uio.no

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New Zealand has presented indigenous people with yet another challenge to their language and culture, at the same time as both are under threat. But it is a challenge that they rose to and won.

Winning their right to sustain and grow their language and culture is crucial. In 1997, David Crystal estimated that 80% of the world's 6,000 or so living languages would die within the next 100 years (Crystal 1997, p. 17). In New Zealand, Benton (1979) had predicted that without changes to language policy, the death of the Māori language was a certainty. The efforts of Sámi in Norway and Māori in New Zealand to save their languages from the contextual background to this paper. The more specific context is the impact of NS and NT on the survival and revival of these languages.

The primary objective of our research was to describe the response of Māori and Sámi educators to the implementation of national assessment protocols. Their response exemplifies the clash between the political and educational hegemony of a dominant culture, and as Rau (2010) states, indigenous ways of knowing. More fundamentally, it is about power relationships and issues of social justice played out between majority and indigenous institutions and cultures (Bell 2003; Corson 1993; Corson 1995; Cummins 1996; Cummins, 2000). In both countries, the threat to translate assessments from the language of the dominant culture into the languages of the indigenous cultures presented a further threat to indigenous ways of knowing.

Our research design utilised primary source documents, including newspapers, the Internet, and official education documents from government institutions. Additionally, it utilised books and peer reviewed articles about the social, educational and political history of the two indigenous groups. An important primary source were semi-structured interviews with Cath Rau, the coordinator of the *reo matatini* team negotiating the design and implementation of *Nga Whanaketanga Rumaki Māori* (the Māori-medium National Standards), one of her research team members, with key Sámi educators and with academics opposed to the introduction of national assessment protocols in both countries. Also utilised, were the combined experience of the authors who have worked with Māori and Sámi educators over many years. Primary source documents were crucial given the unfolding nature of the conflict between Māori and Sámi, and the New Zealand and Norwegian educational authorities.

This paper describes attempts by Māori and Sámi to save their languages, within the broader context of decisions by their respective national governments to introduce national assessment. It outlines the social, political and educational contexts of Māori and Sámi as a necessary pre-requisite to an understanding of their response.

International Contexts

Ravitch (1995) notes that conservative governments, internationally, argue that national assessment protocols improve achievement by defining content and performance standards, that they provide for equality of opportunity and provide accurate information to students, parents, teachers and administrators. More insidiously, Governments, internationally, also use national assessment protocols to reinforce the control of dominant cultures over indigenous minorities. Community leaders in both countries were cogent of the 'equality' and 'accountability' philosophy underpinning national assessment protocols internationally and of the impact those philosophies have on education. Sharples (co-leader of the Māori Party), echoes these concerns thus:

> *The government policy to introduce national standards would mean that parents would choose schools based on the standards they achieved. It will*

> *mean that some schools will be low in support from the community. They are going to lose roll numbers; teachers will not go there. (Waatea News, 2009)*

International experience supports Sharples' concerns. In England around 50% of students fail to achieve five A-C grades (pass grades) in English and mathematics in the General Certificate of Secondary Education (GCSE) and the scale of this failure is associated with social class and school composition (Bell 2003; Krashen 2010). Typically, the reaction of schools with high levels of failing students is to: (i) specify the curriculum in ways that target the test (Gewirtz 2002), and (ii) fabricate results (Ball 2001). Of equal concern, especially for indigenous students, is the diversion of 'time, energy and funding which could be better employed in advancing clearer goals of educational and social justice' (Thrupp 2008, p. 203).

In the United States, the No Child Left Behind Act of 2002 mandated that all states conduct standardized testing in reading and mathematics in grades three through eight, with associated penalties if schools fail to increase grade scores to appropriate levels. What is perhaps most insidious about this psychometric regime is that categories of scores are made public by race and ethnicity. The intentional design of the US tests is to be racially and ethnically neutral, ostensibly to construct a 'fair' test. In reality, constructing tests unconnected to the prior knowledge and values of indigenous and migrant minority students is to discriminate against these students (Krashen 2010; Nichols & Berliner 2007). This is an example of equality resulting in unequal treatment.

The response of US teachers has been to teach to the test. The test becomes the default curriculum. As Lipman (2004) notes this shift can undermine the critical literacy goals of bilingual schools. She describes one predominantly Mexican-American elementary school that was forced to shift from using their students' cultural capital to develop critical literacy, and focus instead on test preparation. It is unsurprising, therefore, that in such a culturally compromised, unresponsive system African-American and Hispanic students in Texas drop out of school early (Haney 2000). Māori and Sámi community leaders were fearful of similar consequences for their people. In the three northernmost counties of Norway in which the majority of the teenagers with Sámi background live and go to school, a recent survey show that one find the lowest proportion of students who completed and highest proportion who drop out of secondary high school (SSB-2010).

The National Contexts

New Zealand. The introduction of NS (seen as a more acceptable version of national testing) in English medium schools fulfilled a promise by the incoming 2008 National conservative government to set assessment benchmarks in reading, writing and mathematics based on a range of measures selected by each school. Work previously undertaken to develop the draft *English Language Learning Progressions 1-4 and 5-8* (New Zealand Ministry of Education, 2008) provided the government with a platform on which to base the reading and writing standards, and by 2009 the *Progressions* had been revised to sit alongside the development of the new NS. Given the sensitivity of the New Zealand Ministry of Education to the perceptions associated with data from international measures, the NS were based, in part, on the Organisation for Economic Cooperation and Development rationale that underpins the *Progress in International Student Achievement* (PISA) and the *Progress in International Reading Literacy Study* (PIRLS) tests. This strategic move was linked to concerns around New Zealand's performance on these tests and can be viewed as another example of teaching to the tests.

Norway. In similar fashion, results from PISA were used as a potential justification for the introduction of National Testing (NT). Like New Zealand, NT was seen as a means of

providing information to facilitate pedagogical development and of providing authorities and parents with information which might encourage dialogue. According to the Norwegian Directorate for Education and Training in Norway (NDET 2010), NT are designed to provide information as to how far students have acquired the basic skills in accordance with the competence targets in the subject curricula. Norwegian NT, introduced in 2004 was an outcome of a unanimous decision of Parliament, although the Red-Green parties expressed concern about the publication of league tables on the Internet. The tests are mandatory for all students, except Special Education students, linguistic minority children who have a limited Norwegian language background, and the Sámi students.

According to the Directorate for Education and Training (DET, 2010), the tests in mathematics and reading are not tests in the subjects of mathematics and Norwegian, but in mathematics and reading as basic skills, regardless of subject. The test in English (as a foreign language) is related to the competence targets in only one subject, English, and focus on comprehension, vocabulary and grammar.

Consistent with the 2010 parliamentary decision, students in the 5th and 8th grades sat NTs in reading, mathematics and English and for the first time, students in the 9th grade sat the 8th grade tests in reading and mathematics.

Sámi students have never participated in NT. Norwegian students are administered NT in their first language, and their competency is assessed against the Norwegian curriculum. On the other hand, the Sámi people have their own Sámi subject curricula, and contrary to language policies forced on many other indigenous people, the Sámi Educational Authorities goal was the construction of NT in the Sámi language, based on the cultural sensitive Sámi subject curricula. However, until recently, the main complication had been that the political will and funding requested by Sámi Educational Authorities to develop these tests. Representation to secure funding from The Directorate of Education and Training began in 2004, but failed because the Directorate's preference was to *translate* the Norwegian tests into the Sámi language - a cheaper option. The Sámi people appose this strategy. Based on principle, they demanded equal opportunities in the form of NT in the Sámi language, developed by Sámi experts.

The existence of three distinct Sámi languages in Norway: Northern Sámi, Lule Sámi and Southern Sámi have further complicated the introduction of NT in all the Sámi Languages in Norway. While all three language varieties stem from the original Sámi language, geographic isolation and the social-political processes during the last several centuries resulted in three distinct languages with their own orthography. Consequently, and to a greater extent than in New Zealand, three are complications around administering test in Norwegian.

The impact of national standards on non-indigenous schools

The introduction of majority language, national assessment protocols in both countries has been fraught with chaotic professional development, confrontation between teacher unions and educational authorities, and boycotts. In Norway, the under-registration of student in some municipalities was as high as 20-25%, because they were given dispensation from taking the tests. In New Zealand, total immersion Māori schools were given a one-year dispensation. Opponents of NS (New Zealand Assessment Academy, 2009; Thrupp, 2008) and of NT (Adresseavisa, 2008; Beck, 2010; Solvoll, 2010) claim that schools ask weak students to stay home on the testing day, because they are afraid they might degrade results, and that schools revert to 'drilling' rather than co-construction teaching. Critics of national assessment protocols in both countries argue that it will not improve teachers' pedagogical content knowledge, or ameliorate the confounding socio-economic variables that impact on learning. In New Zealand, Thrupp (2008) argues against the implementation

of NS given that the concern is with the tail of underachievers, and given data already exists enabling the identification of these students year-on-year. He also notes that predictable cultural changes stemming from the implementation of the assessment protocols are beginning to emerge in non-indigenous schools, internationally. These changes, which can be seen in Norway and New Zealand, include:

- Changes in how schools are judged by parents and the public. (Teacher unions in New Zealand are fighting to prevent the publication of league tables that have become a feature of the Norwegian system);
- Changes in the work of teachers, principals and school board members, and in what it actually means to be these things. (Teachers, internationally, are changing what they teach, how they teach and how they report to parents, sensing that the measure of their worth and value will be based on their students' performance on national assessments);
- Greater anxiety around NS/NT performance in classrooms, staffrooms, among senior management, and at board meetings. (During 2011, approximately 20% of New Zealand schools refused to implement NS);
- Narrowed teaching focus. (In New Zealand, professional development funding has been removed from the arts and physical education and re-directed into literacy and numeracy development);
- Changes in the work done by students, and what it actually means to be a learner. (Students are introduced to assessment-linked lesson objectives and performance exemplars, that determined and constraint what is taught and learned);
- Changes in teacher education. (In New Zealand, numeracy and literacy are beginning to dominate teacher education at the expense of the arts);
- Changes in education policy. (NS/NT has become the focus of political commentary, emphasizing targets for raising the achievement of the long 'tail' of failing students).

The impact of national assessment on indigenous schools

Declarations, internationally, describing human rights and fundamental freedoms are less emphatic when describing linguistic human rights (Skuttnap-Kangas, 2000). Similarly, at a national level, Māori and Sámi languages have official status, but governments promulgating laws that establish national assessment protocols serve to threaten this status. Their conditional respect for indigenous languages echoes the 'opt-out' clauses that apply to international proclamations on indigenous languages. Language policies associated with national assessment follow the same conditional tone – a case of granting Māori and Sámi extensive language rights, but when it comes to national testing, initially leaving them with few rights.

In addition to this general concern, a more specific focus on the response of Māori and Sámi peoples to national assessment requires an understanding of student achievement, the contemporary educational aspirations of these groups, and of their sensitivities borne out of past injustices. This focus is best understood when situated within their respective historical, social and political contexts. In this respect, there are common themes associated with the history of both Māori and Sámi. Both suffered the usual deleterious effects of colonization that resulted in political disenfranchisement, misappropriation of land, morbidity from introduced diseases and socio-economic marginalization and assimilation policies (Waitangi Tribunal, 1986; Walker, 1990 ; Jensen 1991; Keskitalo 1997; Magga 1992). Before issues

associated with educational reform are addressed, we explore three of these themes; marginalization, the ideology of assimilation and the ideology of autonomy.

Marginalization

In recent times, the marginalization of Māori was an outcome of Government's deficit-based educational policy of the 1930s. This policy limited the Māori curriculum to technical subjects (Strong, 1931), because a more extensive curriculum was viewed as beyond the present or future needs of Māori. According to Strong, the prevailing view was that 'Māori boys would make good farmers and the Māori girls' good farmer's wives' (p. 192). However, during the cultural revival of the same period, Māori questioned this policy and their opposition prompted government to permit selected elements of Māori culture to be included within the curriculum of Native Schools[2]. These inclusions reserved the right of Māori to value their *tikanga* (Māori customs and traditions). Most noticeably, however, Māori language was not one of the Governments selected elements. Similar themes resonate in Norway. A two-century-long educational policy saw Sámi children enrolling in schooling, as Hoëm (1976) puts it, 'on the same terms as their counterparts'.

The ideology of assimilation

The assimilationist approach to Māori education in the 19th and 20th centuries is seen in policy that made funding for Māori education contingent on the use of English. Assimilation policies through the 1950s, and integration agendas from 1960, prompted a reaction among Māori evident in their opposition to a multicultural approach in the 1970s, and their support for a bicultural approach in the 1980s (Bishop & Glynn, 1999). Māori also voiced concern around the delivery of *taha Māori* (Māori perspective) within a Westernised curriculum framework, taught mainly in English, which Rau (2005) claims 'further cemented the majority culture as the reference point for defining minority cultures' (p. 405), and which Jenkins (1994) describes as a concession to Māori aspirations for self-determination.

Given long-standing assimilation policies by the dominant culture in Norway, the modern history of the Sámi bears striking resemblance to that of Māori. According to many commentators, the 'Norwegianization' policy in relation to the Sámi speaking students was deliberate and well planned (Greller, 1996; Nergaard, 1994; Niem, 1997; Niem, 2002; Özerk, 1993; Özerk, 2009; Stordahl, 1996). This assimilation policy was articulated by Lutheran missionaries who arrived in Samiland during the 17th century, established Christian schools and encouraged Sami to speak Norwegian. The provision of some sort of formal education to all Norwegian students, regardless of their home-language, goes back to the first half of the 1800s. This type of official equality has dominated educational policy in Norway during the last 150 years. As in New Zealand, this type of equality functioned as assimilative and was ultimately oppressive. Since the language of education in Norway was Norwegian and English in New Zealand, during this period, one also can talk about a policy of 'mechanical equality' (Özerk, 1993) that aimed to eradicate linguistic differences between the Sámi minority and the Norwegian majority and between Māori and the colonists. According to some researchers (Phillipson, 1988; Skutnabb-Kangas, 1988), such a policy, where the minorities are discriminated against based on their language, is *linguicism* (Phillipson, 1992).

An ideology of equality perversely results in unequal treatment, and different measures and provisions for Sámi and Māori, but authorities did not recognize this during the post-Second World War period from 1945 through to the 1970's, (Hernes & Knudsen, 1976; Özerk 1993; Telhaug, 1994). In Norway, from the 1950s through to the 1970s, authorities directed attention towards the provision of 'equality in opportunity', also called 'equality in resources'. The intent of this new approach to equality was to make the educational possibilities of all students independent of their families' socio-economical status, geographic affinity or

language background. Authorities directed effort toward establishing public measures to make students' educational opportunity and school success independent of income and language background. The main objective was to provide every child, including Sámi, free Norwegian language school books, free transport, different scholarship opportunities for boarding (where the language of instruction was Norwegian), and if it were necessary, individual special education in order to give them the chance to achieve results which were compatible with their abilities, potentials and interests. The aim of this assimilationist approach was to assist Sámi access education within the existing system that operated in Norwegian.

Further, Sámi people had the opportunity to ask for translators, free of charge, to access the public services and public institutions other than the school. All these services were offered in Norwegian. The rational behind this practice was two-fold. First, it was to create the Norwegian conception of 'equality' between people with different backgrounds. The officials tried to practice this type of equality by providing those groups who, in some or other way were different from the mainstream majority, 'compensatory measures'. Second, it helped those who do not belong to the mainstream majority, to compensate for what they were *'lacking'* in meeting the demands of the mainstream majority school and other public institutions.

With regard to Sámi speaking students, education was predominantly in Norwegian, although consistent with the existing conceptions of equality, this was questioned from a indigenous perspective in 1970s, but substantial changes in the educational and language policies with social justice and educational development on Sámi terms did not exist until the mid 1980s (Magga, 1992).

The ideology of autonomy

Unlike the parliamentary process in New Zealand that continues to deny Mãori autonomy, the Sámi gained political, but not financial autonomy in 1987. In that year, an amendment in the Norwegian Constitution accorded Sámi people the right to establish a consultative parliament, the Sámidiggi, with 39 seats elected by all Sámi people. Further, amendment paragraph § 110A to the Norwegian Constitution produced significant changes to the lives of Sámi people. It states:

> *'It is the State's responsibility to provide the conditions necessary for the Sámi people to be able to safeguard and develop their language, culture and livelihood'*
>
> (First author's translation)

Included in the Samediggi responsibilities are:

- To maintain and revitalize the Sámi language;
- To fund bilingual public services;
- To maintain and develop Sámi culture, businesses and cultural institutions;
- To protect Sámi cultural heritage sites;
- To develop curriculum documents for the education of the Sámi children from pre-school to secondary school;
- To develop or/and to fund development of teaching aids, textbooks and digital educational resources for the teaching of Sámi in their language.

The Samediggi Childhood, Care and Education Committee and Language Committee, have oversight of these responsibilities, the later functioning as an advisory body on all Sámi language related issues including the maintenance, spreading, revitalization, and development of Sámi languages.

Through a democratic process, the Samediggi has established policies aimed at replacing the assimilative, and so called 'Norwegianization' policy, with policies of equality, social justice and revitalisation (Greller 1996; Nergaard 1994; Niemi 1997; Özerk 2009; Stordahl 1996). The Samediggi has similar aspirations for their people as the Māori Party has for their people. However, unlike Māori, the Samediggi has autonomy, or as described by Māori, *tino rangatira*.

Educational reforms for Sámi

Two significant reforms during 1996-1998: a) A curriculum reform which resulted in a new *Curriculum Document for the Education of the Sámi Children*, which was a first in Norwegian history. b) The adoption of a new *Law of Education* in 1998 gave 6–16 year old Sámi speaking children in compulsory education, the right to be taught in Sámi languages regardless of where they live. This included Sámi children living in the nine municipalities of the core Sámi areas. These developments were important attempts at reversing the language shift, stopping the language decay and revitalizing the Sámi language within the basic school system. Based on these changes we may talk about a basic school reform process carried out predominantly by the Sámi people, and on the Sámi people's terms. Together, these initiatives prompted Corson (1995, p. 80) to state that 'Norway's language policies, developed at a national level; for Sámi peoples, are among the most comprehensive and most effective in the world'

Despite these reforms, there has been a decline in the number of Sámi speakers. The 1970 census counted about 10,500 people with Sámi as their first language (Smith, 1984). A more detailed analysis of the 1970 census data (Auberg, 1978) concluded that there were about 28,000 out of 40,000 Sámi background people with some degree of command of the Sámi language. However, since the 1980s, demographers have variously asserted that the population of the Sámi people was between 18 500 and 20 000 (Hajdu & Domokos, 1980). According to Korhonen (1988), there were about 20,000 people with Sámi background in the 1980s, but only half could speak the Sámi Language. In 2010, there were 905 children of age 1-5 in Kindergarten, and 1,043 students of 6-16 years of age with Sámi language as their first language in the compulsory school system (Statistics Norway, 2010). Some 940 of those students also had Sámi as the medium of instruction.

Educational reforms for Māori

Without the kind of parliamentary authority provided to the Sámi, the first *te kōhanga reo*[3] (Māori language immersion preschool) was opened in 1981, and by 1996 there were 767 such schools catering for over 14,000 students. However, by 2006 this number had declined to 9,493 students (New Zealand Ministry of Education, 2006). Later *kura kaupapa Māori* (elementary) and *wharekura* (secondary) schools were established, but again, attendance at these schools continues to decline. Part of this decline is due to the deleterious impact on urbanization on Māori language.

The 1960s and 1970s was a period of rapid Māori urbanization. Prior to the Second World War, 10% of Māori lived in urban areas, but by 2001 this had increased to 82%. A decline in the use of *te reo* (the Māori language) paralleled the cultural dislocation associated with this urbanization. In 1979, Benton predicted the death of the language, a prediction repeated in later publications (Benton 1983; Benton, 1989). It was this realization, together with the

Māori Language Act of 1987 that recognized Māori as an official language, that prompted the development of Māori-medium schools. Despite these efforts, the number of fluent speakers of Māori continues to decline. By 2001 it was estimated there were 22,000 highly fluent speakers of Māori, and that 58% of Māori adults could speak a few words or phrases (Te Puni Kokiri, 2001).

In October 2010, Waitangi Tribunal[4] chairman Justice Joseph Williams stated that *te reo* was 'approaching a crisis point' (New Zealand Press Association, 2010). The proportion of Māori students in Māori-medium education had dropped from a high point of 18.6 percent in 1999, to 15.2 percent in 2009, and the total number of students in Māori-medium education had fallen every year since 2004. Some 9600 fewer Māori children under six years of age attended *te kōhanga reo*, and 5700 fewer students were taught in *te reo* in 2009, compared to 1999. The proportion of Māori able to speak *te reo* conversationally also declined, with 8000 fewer speakers in 2006 compared to 2001 levels.

As May and Hill (2005) note, a confounding effect associated with this decline, that bears on aspirations to revive Māori language, is that many Māori parents have insufficient knowledge of *te reo* and *tikanga* (Māori customs and traditions) to support their children's learning in immersion schools. Additionally, they note that if children do succeed in an immersion setting, they are still likely to face problems transitioning to English medium schools.

Despite the work of educational authorities in both countries, and the establishment of immersion and bilingual schools[5], the preservation and expansion of indigenous languages in both countries has been unsuccessful. While Māori / Sámi participation in all sectors of education has increased, disparities between indigenous and non-indigenous participation and achievement remain (Te Puni Kokiri 1998). By the end of the century, in both countries, the conclusion was that:

- Traditional indigenous knowledge and methods of teaching that knowledge had been undermined;
- Career options for Māori and Sámi had been limited;
- Resistance, negativity, and apathy towards school and education had developed;
- The educational aspirations of Māori and Sámi had been lowered;
- Teachers' had lowered their expectations of Māori and Sámi achievement;
- Indigenous peoples were over-represented in delinquent behaviour, and likely to leave school with less formal qualifications, thus limiting their participation in tertiary education.

(Hood 2007; New Zealand Ministry of Education, 2006; Simon 1998; Hoëm 2007; Jensen 1991)

Despite massive investment in Māori-medium education in New Zealand, and decades of professional support, there has been little correction in these disparities since they were first statistically identified over 40 years ago (Hunn, 1960; New Zealand Ministry of Education 2002).

While there have been significant changes in language policy in Norway, this has been insufficient for Sámi to recover from the damaging effect of *linguicism*. The challenge now is to stabilize language decay, re-vitalize both languages, and deliver back the languages to those indigenous students who are monolingual in the language of the dominant culture.

The dominant cultures in both countries view national assessment protocols as a panacea for language revitalisation.

National Standards for Māori students

Consistent with that view, a key rationale for the introduction NS in New Zealand was that the process would improve academic achievement among the long tail of under-achieving students. Māori students are over-represented in this tail. For example, Flavell (2007) notes that in 2006, forty percent of Year 11 (mostly 15 year old) Māori students did not meet the literacy and numeracy requirements for level one of the New Zealand Curriculum. PISA data support these data and indicate that indicate Māori achievement in reading is lower than that for non-Māori. By 2005/2006 PIRLS data indicated that the mean score for Māori was significantly lower than the international mean. There was no change in this achievement profile between 2001 and 2005/2006. Rather than improving performance among Māori students, Flavell (2010) warned that the introduction of NS for Māori students had the potential to further stigmatise Māori academic achievement. The consensus among Māori is that National Standards are unlikely to revitalize the Māori language.

The reaction of Māori to NS is unsurprising given the historical, social and political context, the efforts of Māori to exert greater control over their students' education, and their determination that this education should not be at the expense of their own language and culture. At a meeting of more than 200 Māori educators from English-medium and Māori immersion schools in July 2010, a vote of no confidence in the English medium NS was carried, along with a call for these standards to be trialled (Māori News and Indigenous Views, 2010). Māori principals also voiced concern that the English medium NS were not written from a Māori world view (Te Akatea Māori Principals Association, 2010), had not been trialled (a view shared by other education sector groups), had no regard for the identity of the Māori child, and would marginalise the potential of Māori students. Further, concerns voiced by Māori and other academics (Glynn 1985; Metge, 1983), Māori principals and the Māori Party co-leader Pita Sharples were, that the introduction of English-medium NS in Māori immersion schools would label students as failures and increase the perception of low-decile[6] schools and communities as failing.

Faced with pressure from their coalition partner, the Māori Party, the majority National Party agreed to delay the introduction of NS in Māori immersion and bilingual schools until 2011.

The development of National Standards for Māori immersion schools

As the described context suggests, the historic basis for the rejection of NS by Māori immersion schools included:

- Historic struggles aimed at gaining sovereignty over the education of their children;
- Historic failure of Māori students within the English medium system;
- Philosophic differences between Māori and English medium education.

Their call for a set of indigenous NS was a means of mitigating risk associated with the unilateral imposition of English-medium translations of NS by the Ministry of Education.

In response to Māori and the Māori Party in an electorate-dependent coalition with the National Party, the Ministry of Education released funding for the development of Māori-medium NS. The developers of these standards decided on a set of non-negotiable components, driven by the shared belief that NS should not under-mine their *kaupapa* (the conceptualization of Māori knowledge). Consequently, initial progress toward the development of Māori -medium NS was dependent on the Ministry of Education acceptance

of a set of non-negotiable positions from the Māori developers. Final acceptance of these was due to skilled liaison between the Māori development group and the Minister of Education. The non-negotiable components included:

- Acceptance of 'progressions' in place of pass/fail 'standards';
- The inclusion of oral language to the sample of literacy domains, achieved by marginalising *mātakitaki* (visual language) a key component of Māori culture;
- Linking assessment to the time a student had been in immersion education (rather than their age or class/year);
- Assessing students each year, but less regularly than in the English medium context;
- Reporting or 'sign-posting' to parents in plain language every two years, up to Year 10, rather than Year 8 as in the English medium setting, until achievement data needed for annual sign-posting is available;
- Building the capacity of *whānau* (extended family) to understand pedagogical and assessment discourse;
- Directing the focus of Māori-medium NS on who the system is serving the least.

After three months work, the final draft of *Ngā Whanaketanga Rumaki Māori* (NWRM) (The Māori Medium National Standards) (New Zealand Ministry of Education, 2010a) was completed in December 2009. This was achieved by a small group of developers, lead by Cath Rau, who had worked together many times.

From March to December 2010, some 14 facilitators gathered information from 43 Māori-medium schools about the implementation of Māori-medium NS through case studies and other projects. This information was crucial given the relatively smaller evidence base for Māori medium education. Data gathering was also required to ensure the final version of NWRM were set at the right levels, and aligned to *Te Marautanga o Aotearoa* (Māori-Medium Curriculum) (New Zealand Ministry of Education 2010c).

Feedback from this information-gathering process indicated that the NWRM was viewed by Māori teachers as a positive step for their students, *whānau* (extended family) and schools, and indicated that parents and *whānau* wanted to be involved in their children's education. Feedback also indicated some concerns about the alignment of NWRM with *Te Marautanga o Aotearoa*, and that some Māori held fears around the use of league tables. The Māori-medium NS was implemented during 2011.

The broad aim of the Māori-medium NS is to realise student potential, an aim similar to that of the English-medium standards. However, unlike the English-medium standards, the developers avoided a direct translation of the curriculum, and instead developed, from scratch, a culturally responsive assessment protocol that focused on the preservation of *tikanga* (Māori customs and traditions), and on what makes Māori-medium school unique.

The process used to develop the Māori-medium NS is based on 'strengthening teacher confidence and capacity to make professional judgements about learners' (Rau 2005:6). Although the developers feel their standards will be 'acceptable' when they are regarded as equal to English-medium measures, this does not signal that Māori are deferring acceptance of their language, education and culture to that of the majority culture.

The development of National Tests for Sámi immersion schools

Linked to the Norwegian *Knowledge Promotion Reform* of 2006 was the decision to establish NT in reading (in Norwegian), mathematics and English (as a foreign language). Like NS in New Zealand, and internationally, the Norwegian test protocol was designed to hold the education system accountable, and to obtain some degree of evidence about the health of the system over time (Hall & Özerk, 2009). As the Norwegian Directorate of Education, 2010 – Parent Brosjure states:

> *The results of the tests will provide information that schools and local and central authorities will use in their work of improving the quality of education. (p.1)*

During 2011, the content of the National Tests in mathematics was translated into Northern Sámi, Southern Sámi and Lule Sámi languages, allowing all students in the country take the same test. The National Test in English is the same for all children in the country. Since 2007, the Sámidiggi has been insistent that the National Reading test should be based upon the competence aims laid down in the Sámi Curriculum. However, at the beginning of 2008, the Norwegian Government authorities signalled their intention to translate the National Reading Test from Norwegian into Sámi languages, something unacceptable to Sámi Parliament and the Sámi Educational Authorities. This was also the position taken, briefly, by the New Zealand Ministry of Education, a move that seen as the dark side of negotiations with indigenous peoples. In a meeting between Sámi educational authorities and the Norwegian educational authorities on 2nd of December 2010, the Sámi representatives said their last word on this three years old dispute, restating their position that translation from the Norwegian was unacceptable to the Sámi Educational Authorities. A break-through came in January 2011 when the Norwegian Minister of Education signalled he would recommend to Government that funding be provided to Sámi to allow them to construct NTs in Sámi.

A comparative analysis

Both Māori and Sámi share similar histories of assimilation, marginalization, and the deleterious impact of an educational hegemony that have shaped their response to national assessment protocols. Both cultures have shown persistence and determination to resist these threats to their cultures. Their success is evident in culturally responsive curriculum. In the case of Māori this is evident in a culturally responsive set of NS, while Sámi have a parliament vested with responsibility to sustain indigenous languages.

National assessment protocols present a challenge to the language, culture and ways of knowing of Maori and Sami. Consequently, the response of Māori and Sámi, who were subjected to similar colonizing histories, has been one of suspicion and aggression toward their hegemonic educational masters. Additionally, both cultures face the challenge of ameliorating the potential impact of governments' looking for 'equable' accountability, and cost-effective means of providing national assessment protocols. Both cultures have challenged the assimilative policies of their national governments implicit in national assessment protocols, and replaced them with revitalisation policies. In the case of Māori these policies were based on non-negotiable components for NS.

Different political arrangements have facilitated Māori, and until recently, frustrated Sámi in realizing of their goal of developing culturally responsive assessment protocols. Sámi seemed to be in a stronger position to achieve their goal given their political parliamentary autonomy. In contrast, Māori were in a precarious coalition arrangement with a conservative national government, both dependent on the whims of the electorate, and in the case of Māori, stability within caucus. Given these arrangements, it is curious that Sámi have a long

history of protest against NT, whereas the debate between Māori and educational authorities over NS was quickly resolved. This may be a case of political opportunism. Despite their efforts in the political arena, both cultures face a decline in the number of fluent speakers, and in the involvement of their children in language-immersion schools. This is a situation national assessment protocols are unlikely to improve.

In late 2011, the recommendation of the Norwegian Minister of Education to the Norwegian Government was accepted and it was agreed that the Sami People should construct national tests in reading and in the Sami language. The development of these tests has been contracted to the Sami University College. The first meeting to discuss practical issues related to the development of the tests took place 30th August 2011.The first administration of these tests is scheduled for the Fall of 2012.

To their great credit, the developers of the Māori and Sami national assessments seem to have avoided the negative aspects of the US and English assessment protocols. Māori have negotiated culturally responsive NS and are developing the exemplars and instrumentation required for the validation of these standards. Sámi, with an enviable history founded on a proactive language policy, have won the same type of opportunity as Māori. As Rau (2010) suggests, without a culturally responsive set of national assessment measures, the cultural fragility and social conscious of indigenous languages and cultures remains under threat.

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Notes

1. Cath Rau, is coordinator of the *reo matatini* team negotiating the design and implementation of *Nga Whanaketanga Rumaki Māori.* Rau is a specialist in Maori language and culture regeneration. She has either developed or contributed to a wide range of significant Māori language/literacy development initiatives both at national and local levels, authored numerous teaching and learning materials for use in schools delivering in the medium of Māori and recently published *Assessment in Indigenous Language Programmes* in the *Encyclopedia of Language and Education* (edited by Nancy Hornberger, Springer, 2008).
2. Until the 1860s, the government subsidized church schools for the Māori. By the 1860s, three-quarters of the Māori population could read in Māori and two-thirds could write in Māori. The Native Schools Act of 1867 offered secular state-controlled primary schools to Māori communities who petitioned for them. In return for providing a suitable site, the government provided a school, teacher, books, and materials. The act required that English be the only language used in the education of Māori students, and Māori were generally strongly supportive of their children learning English as they saw benefits in being able to work with Pākehā (Pākehā is a Māori term for New Zealanders who are not of Māori blood lines). The Native Schools remained distinct from other New Zealand schools until 1969, when the last 108 Native Schools were transferred to the control of education boards.
3. Te Kōhanga Reo is a total immersion Māori language family programme for young children from birth to six years of age.

4. The Waitangi Tribunal (Māori: *Te Rōpū Whakamana i te Tiriti*) is a New Zealand permanent commission of inquiry established under the Treaty of Waitangi Act 1975. It is charged with investigating and making recommendations on claims brought by Māori relating to actions or omissions of the Crown, in the period since 1840, that breach the promises made in the Treaty of Waitangi.
5. A Māori immersion school is where all students at the school receive over 80% of their instruction time in Māori language. A Māori bilingual school is where all students at the school receive over 12% of their instruction time in the Māori language.
6. Decile 1 schools are the 10% of schools with the highest proportion of students from low socio-economic communities, whereas decile 10 schools are the 10% of schools with the lowest proportion of these students.

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Elementary *SuperVision* and the Supervisor: Teacher Attitudes and Inclusive Education

Thomas G. RYAN *
Nipissing University, Canada

Jodi GOTTFRIED
Nipissing University, Canada

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Abstract: Evidence has emerged which suggests that as a supervisor, the importance of knowing oneself, and knowing those that he or she is supervising, is vital to the success of the group. We argue that when conflicting values, attitudes, and beliefs are present amongst the members of the group over an issue (inclusion), or over the behaviours of a member (non-inclusive), the entire group can break down. Therefore, to successfully implement a program, such as inclusion, knowing the attitudes of the staff is vital as a program such as this cannot be successful without positive support.

Keywords: Supervision, Inclusion, Attitudes, Self-Knowledge

Introduction

Glickman, Gordon, and Ross-Gordon (2010) describe the term *SuperVision* as a common vision "that is developed collaboratively and brought into reality together. It forms connections that focus organizational and individual goals, objectives and efforts into an overarching strategy" (p. 56). Capacity is built into the system as the supervisor encourages employees to reach their full potential, and helps to develop interpersonal relationships and a productive organizational culture (Dessler, Munro & Cole, 2011). These outcomes are achieved by daily informed supervision. The supervisor, by definition, is someone who assists, guides, directs, and oversees the people that he/she is managing, however there is much more to being a supervisor than simply overseeing the jobs that people are doing (Langton, Robbins & Judge, 2011). In order to be a successful supervisor, it is important that one understands not only their own beliefs towards education and approaches towards individuals and groups, but that they also understand the beliefs and approaches of their supervisees.

* Thomas G. Ryan, Nipissing University, Faculty of Education, 100 College Drive, North Bay, Ontario, P1B 8L7, Phone: 1 705 474 3461 X4403 FAX : 1 705 474 1947. E-mail : thomasr@nipissingu.ca

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One issue that has been controversial in most schools for many years is the issue of inclusive education. "Inclusion is primarily an overarching philosophy that advocates for the regular classroom as the first placement option for students with exceptionalities" (Edmunds & Edmunds, 2008, p. 24). Arguably, the successfulness of inclusive education relies heavily upon the attitudes and beliefs of the teachers. As a supervisor, it is necessary to have an understanding of the supervisee's belief systems in order to successfully implement inclusive education programs within a school because without the support of the teachers, these programs are destined to malfunction.

Know Thyself

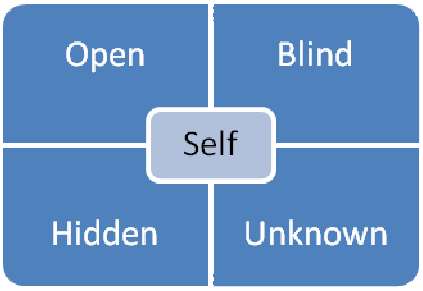
In order to improve and advance our instruction, and hence improve student learning and experiences, we believe that we need to first look to ourselves to determine how our "present thinking, beliefs, and practices in the field of supervision interact with instruction and the assumptions about students… as learners" (Glickman, Gordon & Ross-Gordon, 2005, p. 78). We make judgements about our students on a daily basis whether we realize that we are doing it or not. We believe that these judgements can impact the way that we view that student and the level of interaction that we provide for that student, hence influencing the level and quality of learning that that student experiences.

The Johari Window

One way to recognize our personal thinking, beliefs, and practices is through the reflection that comes from the use of the Johari Window. The act of looking in or back is often misunderstood. Bolton (2010) suggests,

> Reflection is a state of mind, an ongoing constituent of practice, not a technique, or curriculum element. Reflective practice can enable practitioners to learn from experience about themselves, their work, and the way they relate to home and work, significant others and wider society and culture. It gives strategies to bring things out into the open, and frame appropriate and searching questions never asked before. It can provide relatively safe and confidential ways to explore and express experiences otherwise difficult to communicate. (p. 3)

The combination of reflection and a tool such as the Johari window can be a prominent and constructive approach to understanding ourselves and our experiences. This tool "provides a graphic way to look at what we know and do not know about our behaviour" (Glickman, Gordon & Ross-Gordon, 2005, p. 101). This visual tool allows us to reflect on the different levels of self and the attributes that we allow to be known. Four categories exist including the public self (open), the blind self, the private self (Hidden), and the unknown self.



The Public (Open) Self is where both the supervisor and the supervisee are aware of the behaviours. The Blind Self occurs where the supervisees are aware of what behaviours take

place, but the supervisor is unaware of these behaviours. The Private (Hidden) Self is the knowledge that the supervisor has about him/herself but the supervisees do not. Finally, the Unknown Self is the behaviours that both the supervisor and the supervisee are not aware of (Glickman, Gordon & Ross-Gordon, 2005).

The reasoning behind the use of the Johari window is that as supervisors, we cannot know if we are being effective for our team unless we know what we are doing (Langton et al., 2011). In an educational setting, this remains true for both principals and for teachers. We must first know ourselves, before we can be effective supervisors and effective educators for our students. The Johari window is based on the premise of communication and improving methods of communication through asking questions, or telling information (Armstrong, 2006). This exposure allows us to understand where the other person is coming from, what background experiences they have to shape their position, and what beliefs, values, and ideas they hold (Armstrong, 2006). This information cannot necessarily be shared without effective communication and provides great opportunities for understanding between a supervisor and a supervisee (Langton et al., 2011).

Although the authors have described the Johari window in terms of the supervisor, we believe that this process can begin with the supervisee. To first understand where I stand with my own beliefs, what I am willing to disclose to others, and what I choose to keep hidden, all effect my levels of communication with people, and how I choose to interact with people. We must first understand ourselves before we can begin to understand others. In order to understand myself, honesty and accuracy is vital (Bolton, 2010; Armstrong, 2006). If I am not being honest with my own beliefs and perceptions, cognitive dissonance can result between what I believe about myself, and what others believe about me.

Cognitive Dissonance

Cognitive Dissonance occurs when one has an image of themselves while others have a different image. "Cognitive dissonance may allow individuals to make their implicit conceptions explicit, and examine their implicit conceptions from a new light" (Olson, Colasanti & Trujillo, 2006, p. 282). To do this however requires an inner awareness and for those who lack this presence of mind cognitive dissonance may remain problematic. For instance, when considering the relationship between a supervisor and a supervisee, differing views of a person have the potential to cause confusion within a group. To illustrate this case in point, while on practicum, we had the opportunity to observe many teachers around the school and we were surprised to have a conversation with one colleague who had once been a teacher of ours. We did not have a good experience with this teacher, we found her to be intimidating, controlling, and basically, forbidding. This teacher, however, spent a great deal of time talking to us about the importance of building relationships with students, getting to know your students, and respecting your students. From our experiences with this teacher how we were taught, and what we observed, these were not traits that were being shown, and this teacher was in a state of cognitive dissonance. We found it difficult to then communicate with that teacher honestly, to ask questions, and to expect an honest response. We did not go back to that classroom to observe and instead moved on to observe other teachers who we felt comfortable with.

This short experience showed us how important it is to know yourself and how your actions move towards other people. We did not feel comfortable having a conversation with this particular teacher because we did not feel that she was a person who was unable to act upon this cognitive dissonance. It was very obvious that she did not see herself as being intimidating to students. We feel then, that in a group dynamic, it is necessary to be in tune with your personality, your beliefs, and your values and to ensure that these beliefs and

values are being acted upon through your actions and words. If cognitive dissonance results and perceptions do not match, then the group dynamic can be affected because honesty and accuracy are not being practiced. We find it difficult to be honest around people who are not being honest themselves, and we believe that this situation also occurs within groups of people. This makes it necessary for both supervisors and supervisees to know themselves so that they can portray an honest image to their peers.

Attitudes and Inclusive Education

Inclusive education is one issue which is consistently being debated; it is also an issue that is heavily reliant upon the positive support of teachers. In order to demonstrate the importance of being aware of personal attitudes and being aware of attitudes of other group members, we will use the issue of inclusive education to show how important attitudes are to the successfulness of these programs. As well, we will then show how the supervisor can help the reluctant teachers to feel more comfortable in these situations.

Prevalence of Teacher Attitudes in the Research

Studies which examine the attitudes of teachers towards inclusive education consistently state that the attitudes of teachers have a great effect on the successfulness of these programs. However, the present day literature does not consistently state that teachers are generally in favour of inclusion, or not in favour of inclusion indicating that a divide still exists amongst educators on whether students with special needs should be included within the regular education classroom.

Positive attitudes. Several studies published within the last several years have indicated that teachers generally have a positive attitude towards inclusive education. Subban and Sharma (2005) concluded, "teachers in Victorian schools may generally hold positive attitudes toward the inclusion of students with disabilities into mainstream settings" (p.9). Mdikana, Ntshangase, and Mayekiso (2007) investigated pre-service educators' attitudes towards inclusive education and revealed that 60% of the 22 students surveyed responded positively towards inclusive education. As stated in Monsen and Frederickson's (2004) work, studies conducted by Janney, Snell, Beers and Raynes (1995) and Stanovich (1999) both discovered that teachers had very positive attitudes towards inclusive education. These attitudinal orientations are key since,

> inclusion is a philosophy that brings students, families, educators, and community members together to create schools based on acceptance, belonging, and community. Inclusionary schools welcome, acknowledge, affirm, and celebrate the value of all learners by educating them together in high-quality, age-appropriate general education classrooms in their neighbourhood schools. (Salend, 2005, p. 36)

Negative attitudes. The need to examine teacher attitudes can be linked directly to classroom cohesion and socio-emotional climate within classrooms (Mdikana, Ntshangase, and Mayekiso, 2007, p. 130). Ryan (2009) suggested,

> The cohesion and climate within the inclusive classroom is partly due to the fact that students begin to notice differential treatment as early as the primary grades (K-3) and at about age 8 most children become aware of differences in others and in the manner the adult acts towards students. . . . Children, at 8 can often now see clearly when people are being treated in a different way. Hence the actions of a (negative) teacher are not only sensed by young children they understand often that a teacher has assumed an unhelpful (negative) attitude toward certain children with or without

> exceptionalities. Obviously, the impact and the effects can be detrimental to the development of all students in this classroom who sense this treatment. (p. 17)

Hammond, Helen, Ingalls, and Lawrence (2003) illuminated the attitudes of elementary school teachers toward inclusion and discovered "an overwhelmingly strong pattern of either a negative feeling or uncertainty toward inclusion," although the majority of the respondents had inclusive education programs operating in their schools (Hammond et al., 2003, p.3). Another study conducted in the United Arab Emirates studied the attitudes of general education teachers toward inclusion. This study concluded that "general education teachers in the UAE, in general, tend to have negative attitudes towards the inclusion of students with disabilities" (Alghazo & Gaad, 2004, p. 97).

Implications of Teacher Attitudes

These studies show a general divide amongst educators concerning this issue of education. We have to then consider what the implications are for the programs, and for the supervision of groups of people with such differing opinions towards a single issue. First, we consider the implications for inclusive education programs considering the general attitudes of educators towards this issue. Second, we consider what a supervisor may need to do in order to alter the attitudes of his or her supervisees considering the attitudes of the staff and the implications that can result from these attitudes.

Effects on Student Learning

Advocates for inclusive education have argued that full inclusion of students with special needs aids in the learning of both the exceptional student, as well as the regular student. Dixon (2005) stated that "this learning is more genuine when students simply attend school together, rather than when students with disabilities visit regular classrooms" (p. 41). In addition to this, Dixon argued that inclusion has the power to teach all involved, students and teachers, how to understand and accept people with disabilities as a part of life. This idea is very positive for advocates and supporters of inclusion. Teachers who favour inclusion have the ability to expose and enlighten all students, exceptional or not, to what we can all teach each other.

A concern stemming from this idea is that those teachers who do not view inclusion positively will not recognize or embrace these opportunities to learn from our differences. Combs and Harper (1967) recognized that if a teacher's attitude towards a child is negative, that the behaviour of others could extend the students exceptionality rather than aiding the child. This idea is very troublesome when recognizing that negative attitudes towards students in the inclusive classroom still exist.

Effects on Teaching

As previously stated, the most obvious effect of negative attitudes towards inclusive education is that without teacher support, it is almost impossible to implement a successful inclusive education program. Hammond et al. (2003) stated that an unsuccessful inclusive education program "would only strengthen negative attitudes of uncertainty regarding inclusion and its benefits" (p.4). It seems then, that negative attitudes result in an unsuccessful program, and an unsuccessful program results in strengthened negative attitudes (Gottfried, 2007), showing a supervisor the importance of combating these attitudes within the group early on. This cyclical pattern could prove to be the downfall of inclusive education if educators' views continue to hold negative opinions. Therefore, it is necessary to first have a solid program in place, and then introduce and train teachers to be

successful in this program. With an unsuccessful program, teachers will only become more frustrated with the system and form a negative opinion of the concept as a result.

Kuyini and Desai (2007) sought to discover if educator attitudes towards inclusive education and educators' knowledge of inclusive practices were related to effective inclusive school practices. The study found that "attitudes towards inclusion . . . and knowledge of inclusive education . . . were predictive of effective teaching in inclusive classrooms" (Kuyini & Desai, p.109). This conclusion builds on the idea presented in Burke and Sutherland's (2004) findings that without positive teacher attitudes towards inclusion, inclusive classrooms would not be successful because teachers would not have the commitment to implement inclusive practices. Therefore, in order to present effective teaching in an inclusive classroom, a commitment to and a positive attitude towards inclusion must be present (Gottfried, 2007).

Teachers possessing a positive view towards inclusive education can become contribute to negative effect on teaching and learning. Talmor, Reiter, and Feigin (2005) concluded that teachers' attitudes towards inclusion were most significantly linked to burnout as compared to the other background variables (p.212). The authors go on to state that those who had a positive perception towards inclusion also had high expectations and realized that they could not meet these high expectations (Gottfried, 2007). They, therefore, experienced a higher rate of burnout as compared to those who did not have a positive attitude towards inclusion (Talmor et al.).

This trend is, perhaps, not a deficit in educator ability but a deficit of training and resources as the authors stated that "teachers seemed to feel that they hardly had any information at all, and once the student was enrolled in their classroom the help they received was minimal" (Talmor et al., p.222). This result seems particularly disturbing with educational policies increasingly moving towards inclusive education. With the teachers who favour the practice most favourably leaving the profession, it seems that implementing a successful inclusive education program with committed teachers could be a challenge (Gottfried, 2007).

The Role of the Supervisor

Using this example of inclusive education as an issue in schools, one can easily see how important it is to know your own beliefs, as well as knowing the beliefs of those around you. Our attitudes can easily influence others either positively or negatively and as a supervisor it's necessary to use those influences in order to help the group in reaching a common goal. In this scenario, the common goal is to implement inclusive education programs. In a world where a divide exists amongst educators towards reacting positively or negatively to inclusive education, it is realistic to assume that a supervisor will encounter a divide amongst his or her staff. When realizing the consequences of allowing negativities to prevail, including unsuccessful programming, negative teaching practices, and disadvantages to student learning, it is necessary for a supervisor to take hold of the situation and to build positive attitudes within the school.

Know Your Staff

The question remaining then is: how is a supervisor to turn around the personal attitudes of a staff in order to benefit from inclusive education programs? After reviewing the ideas behind knowing thyself and the consequences that can arise from differing attitudes, we believe that an obvious place for a supervisor to begin is with his or her own staff. To discuss through open communication the concerns that different staff members may have about inclusive education would allow for ideas to be shared, and, perhaps, for areas from the "private self" of the Johari window to be moved to the "public self" so that we can all better understand not only ourselves, but each other. Without open, honest, and accurate

communication, the benefits of the Johari window cannot be reached. We believe that it is the role of the supervisor to create an environment where the staff feel a level of comfort and trust that allows them to experience this open, honest reflection with their peers without fear of ridicule or disrespect. With this open, honest communication, some members may learn elements of their "blind self" that others were aware of that the individual was not. With these realizations, areas of cognitive dissonance may be rectified allowing for an individual to be aware of their own beliefs, behaviours, and actions.

After open communication has been established, and the supervisor is aware of the attitudes and beliefs that are held by the staff, we believe that input from the staff as to why they hold the beliefs that they do, and what they need to help with the situation would be invaluable. We believe that sometimes finding a solution can be as simple as asking what needs to be done and acting on that.

Professional Development

The literature concerning teacher attitudes and inclusive education showed an obvious reason why concerns toward inclusive education have continued throughout the years. A lack of knowledge and a lack of training were consistently cited in the literature stemming the 1970's to today. Brooks and Bransford (1971) felt that "from knowledge comes understanding and from understanding comes acceptance" (p. 259). They went on to conclude that reasons behind negative attitudes of the time stemmed from a lack of knowledge concerning the roles and functions surrounding special education. As well, Van Reusen, Anthony K., Shoho, Alan R., Barker, and Kimberly S. (2001) concluded in their study concerning high school teacher attitudes towards inclusion that levels of special education training, knowledge, and experience in working with these students were related to teachers having a positive attitude toward inclusion. Subban and Sharma (2005) included in their discussion towards understanding educator attitudes towards inclusion that "the most negative views about inclusive education are held by teachers with little or no training in special education" (Gottfried, 2008). If we assume that these concerns are general concerns amongst opponents to inclusive education, then this is exactly where the supervisor needs to begin: with knowledge and training.

In education, knowledge and training generally grow via professional development which is essentially, "the continuous education of educators" (Glickman, Gordon & Ross-Gordon, 2010, p. 276). Common characteristics exist as to what should be involved in successful professional development, these include, and are not limited to, the involvement of participants in planning, implementing, and evaluating the programs; developing programs based on school goals; and developing long-range plans (Glickman, Gordon & Ross-Gordon). Using the example of inclusive education, first the staff would need to be involved in the planning to consider what their needs are; this could come through open communication of teachers and staff explaining what they need in order to be more successful in this program. School-wide goals would need to be established to foster an inclusive environment for all students throughout all classrooms in the school. This could include school wide events, combining classes for different activities and subjects, and making values of inclusion for all students, including race, religion, disability, etc. a daily occurrence. Finally, these goals of inclusion would need to be factored into the long-range goals of the school to ensure that these values are continued and developed.

Considering that negative attitudes towards inclusive education can weaken the program and create strengthened negative attitudes, I feel that it is safe to assume that positive attitudes can strengthen the program and create strengthened positive attitudes. From the standpoint of the supervisor trying to implement professional development for his or her

staff, it would then be beneficial to use the positive attitudes of staff members to show those who are negative what benefits can come from inclusion and how inclusion can work in a classroom. The necessity of knowing ones staff is vitally important here as a supervisor would need to know not only the attitudes of the staff, but the needs of individual staff members and the leadership and training styles that best suit each person so that staff members are not left feeling uncomfortable or unwilling to participate when other staff members are highlighted for their teaching performances in inclusive classrooms.

Conclusion

As a supervisor, the importance of knowing oneself, and knowing those that he or she is supervising, is vital to the success of the group. When conflicting values, attitudes, and beliefs are present amongst the members of the group over an issue, or over the behaviours of a member, we believe that the entire group can break down. For a supervisor to successfully implement a program, such as inclusion, knowing the attitudes of the staff is vital as a program such as this cannot be successful without positive support. The only way that these issues can be managed is if individuals first understand their values and share these honestly. With this openness, shared goals, and collaborative decision making are next required to create professional development initiatives. Without this open understanding of each others concerns, these programs can become weak and ineffective leading to negative attitudes. These inclusive agendas are fated for failure without the positive support of staff however, it always begins with the individual values before it can become a collective value.

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Socioemotional Competence, Self-Perceptions, and Receptive Vocabulary in Shy Canadian Children*

Sandra BOSACKI**
Brock University, Canada

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Abstract

Given existing gendered stereotypic assumptions regarding shyness and children's school competencies, this study explored relations among socioemotional competencies, self-perceptions, and receptive vocabulary in shy children. Ninety-one Canadian children (52 girls, 39 boys; 5-8 years) were classified as shy (n = 26) based on teachers' behavioural ratings (n = 8), and completed self-perception and vocabulary measures. Compared to their non-shy peers, shy children reported lower levels of self-worth, and were rated by their teachers as more aggressive. Shy girls scored the lowest on the vocabulary task, and received the highest teacher emotional competence ratings. Shy boys scored the highest on the vocabulary task, and received the lowest emotionally competence ratings. Gender-role stereotypes and shyness and their educational implications are discussed.

Keywords: Shyness, Socioemotional Understanding, Middle Childhood, Language

Introduction

Across educational and psychological research domains, there has been a rise in the interest in the emotional and social aspects of learning (Bruner, 1996; Rubin, Burgess & Coplan, 2002). Increasingly, recent research with young school children shows that shyness or social withdrawal may play a significant role in children's socioemotional and cognitive development (see Rubin et al., 2009, for a recent and extensive review). Despite the theoretical and practical implications of investigating the inner and social world of the shy child, empirical support for the gendered links between children's social withdrawal and socioemotional competence remains sparse and existing findings are inconsistent and variable (Chang, 2003; Rubin & Asendorpf, 1993; Rubin, Coplan & Bowker, 2009; Wichmann, Coplan & Daniels, 2004).

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** Sandra BOSACKI, Brock University, St. Catharines, ON. Canada L2S 3A1, Phone: 905-688-5550 (Ext. 4987) E-mail: Sandra.bosacki@brocku.ca

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Thus, the main purpose of this research was to explore gendered relations among socioemotional competence, self-perceptions, and language abilities in shy Canadian school aged children. In particular, building on psychocultural theories of self-system and social behavior (e.g., Bussey & Bandura, 1999; Maccoby, 1998), this research explores teachers' perceptions regarding the mental states, motivations, emotions, and socio-communicative competence of shy/quiet children in their classrooms. Moreover, given past research conducted in North America suggesting that shy behaviors may be less tolerated and more problematic for boys than for girls (Rubin & Coplan, 2004), gender differences were also explored within a Canadian context.

Role of Gender, Self-Perceptions, and Language in Shy Children's Socioemotional Competencies

A substantial part of children's emotion understanding is mediated through language processes in particular cultural settings such as parent-child conversations in the home, or peer-peer and teacher-child conversations in schools (Kitayama, Markus & Matsumoto, 1995). A psychocultural approach to emotion assumes that language and emotion development are interdependent and have their origins in social interactions with more skilled partners (Gergen, 2001; Vygotsky, 1978). That is, cultural frames or culturally shared systems of meaning including gender help to shape emotional experience and one's developing sense of self through the social interactions and communication with others (Lutz, 1988; Maccoby, 1988).

Regarding the emotional competence and language in middle childhood, many researchers (e.g., Harre, 1986; Saarni, 1999) claim that emotion words play a large role in the child's conceptualization of emotion. Thus, according to Kopp (1989), emotion language "provides children with an especially powerful tool for understanding emotions" (p. 349). Several recent studies highlight the importance of language in children's emotional understanding. For example, researchers suggest that the links are complex, especially those concerning emotion understanding across gender and countries (Harris, 1989). More recently, Gergen (2001) has extended the notion that language and emotion are inextricably linked, by proposing that people should create the emotional forms or scripts that are essential to encourage people to take responsibility for their actions.

Given the strong conceptual links among language, self, and emotion, it is surprising that relatively few researchers have examined the role language competence plays in the development of socially withdrawn children's socioemotional competence. However, some researchers, have assessed emotion understanding in the absence of any general language measure (e.g., Laible & Thompson, 1998). Consistent with past studies which often include standardized measures of language competence, (e.g., Carroll & Steward, 1984; Dunn & Hughes, 1998), the present study investigated receptive, vocabulary ability. Few researchers have investigated the role language plays in shy children's emotional competence and self-perceptions from a psychocultural perspective (for exceptions see Capps et al., 1992; Russell & Paris, 1994; Harris, 1989). Given Maccoby's (1999) conceptualization of gender as a culture, a psychocultural approach to the study of socioemotional competence could help to examine the gendered links among shyness, language, and self-perceptions. Past research on socioemotional competence among older children and adults suggests that girls and women exhibit a higher level of socioemotional competence than do boys and men (Bybee, 1998; Markus & Kitayama, 1994).

Regarding the role of gender in children's socioemotional competence, some studies reveal contradictory findings. For example, compared to young boys, young girls have been found to exhibit a greater expression of pride after success on a task (Stipek, Recchia & McClintic, 1992), and to express greater emotional regulation and displays of shame and guilt

(Kochanska. 1994). In contrast, some studies have failed to find gender differences among emotions of pride, shame, and guilt in school-aged children (Griffin, 1995; Kornilaki & Chlouverakis, 2004). The reasons for these contractions may be due to either conceptual issues or definitional issues such as different definitions of complex, moral emotions such as pride and shame. Differences could also be due to differences to varied methods as well, as well as the data analysis procedures. Accordingly, given the complex gendered patterns of associations among socioemotional competence, self-perceptions, and language, (Denham, 1998), more research is needed on individual differences on these variables among shy children.

Self-Concept, Socioemotional Competence, and Shyness

Although shyness is often defined as the reluctance to engage in interpersonal interactions, it also implies a metacognitive or evaluative component. For example, the relation between shyness and social anxiety or embarrassment, suggests an evaluation of the self against some kind of ideal self (Lewis, 1995). This often negative evaluation component may be linked to metacognitive factors such as the ability to reflect on one's own thinking and self-image, in addition to various social-cultural factors such as gender and ethnicity. Given this metacognitive definition of shyness, the concept of shyness in middle childhood needs to be examined from a psychocultural perspective (Bruner, 2006). That is, researchers need to explore individual differences among the variables, and the influence of sociocultural factors such as gender and language.

Some researchers approach the concept of self and emotion in middle childhood from a psychocultural perspective which defines the self as a multidimensional, constantly changing process or system, co-created by conversation and context (Bruner & Kalmar, 1997; Markus & Kitayama, 1994). Children's views of themselves as human beings, and also of a particular gender, is transmitted and reinforced by various social agents including family, peers, and the mass media. Parental influences have received the most attention with a number of North American studies showing that maternal comments and modeling influence preadolescent girls' self-perceptions and attitudes concerning body image and self-views (e.g., Smolak, Levine & Schemer, 1999).

However, the majority of research on self-conception deals with children's verbal and written accounts in the forms of interviews, self-report questionnaires, and narratives who are considered typical or not viewed as specifically shy or socially withdrawn (see Harter, 1999 for a review). Few studies examine the connections between shy children's self-perceptions, social and emotional competence and language ability and self-story within the school context during the ages of 6-10 or middle childhood. Developmentally, middle childhood often involves the commencement of schooling experiences that represent children's interactions with teachers, peers, and others (Harter, 1999). The social experiences during this transitional time provides an opportunity for children to co-create various sense of selves with significant others in various aspects of their lives and to develop in that they may develop different selves with their peers, parents, teachers, etc. (Bruner, 1996). Given this complex social context of the school environment, and the possible influence of peers and teachers on children's self-perceptions, socioemotional competence and language ability may differ for children considered to be shy or socially withdrawn.

Despite the claims that suggest girls possess a less coherent and positive self-theory than boys (e.g., Maccoby, 1998; Tavris, 1992), and the empirical evidence that preschool-aged girls show more frequent mental state talk than boys (Hughes & Dunn, 1999), differential gender links between self cognitions and socioemotional development, especially with shy and non-shy children during middle childhood have not yet been studied in depth. For example, little

is known about the connections between shy children's emotional understanding or the ability to discern one's own and others' emotional states and to use the vocabulary of emotion effectively (Saarni, 1999) and shy children's perceptions of self, social and emotional experiences and language ability, especially during the middle childhood years. Thus, this study examined to examine the complex web of correlates among shy and non-shy children's socioemotional competence, self-perceptions, and language.

Related to self-perceptions, another aspect of metacognitive ability involves emotional competence. Emotional competence refers to the ability to express, regulate, and understand emotions (Denham, 1998). When functioning optimally, these three sets of skills are intricately interdependent and work together in an integrated way. Emotional expressiveness is the ability to express and/or experience emotions such as positive affect. Emotion regulation refers to the "extrinsic and intrinsic processes responsible for monitoring, evaluating, and modifying emotional reactions… to accomplish one's goals" (Thompson, 1994, p. 27-28). Finally, emotion understanding or knowledge refers to the ability to identify the expression on a peer's face or to comprehend the emotions elicited by common social situations (Denham, 1998; Denham et al., 2003). As an integral part of emotional competence, for the purpose of this article, I have chosen to use Saarni's definition of emotion understanding as the ability to discern one's own and others' emotional states and to use the vocabulary of emotion effectively.

Gendered Relations among Self-Perceptions, Socioemotional Competence, and Language in Shy Children

Teachers play a crucial role in both the gender role socialization and co-construction of children' social-cognitive and linguistic abilities (Arbeau & Cooplan. 2007; Purkey, 2000). However, surprisingly few researchers have studied the links among teachers' perceptions of shy children's socioemotional competence, children's self-perceptions and language ability. In general, the empirical evidence on the role of gender in emotional competence remains inconsistent and fairly scarce. In brief, past research has found that girls outperform boys in emotion understanding tasks and receive higher emotional competence teacher ratings (Cutting & Dunn, 1999; Parent et al., 1999), as do middle-school children (Bybee, 1998) and adults (Brody, 1999). Although researchers have claimed that girls seem to internalize earlier and more completely the message that it matters how people feel, some studies have demonstrated either no gender differences exist in emotion competence (e.g., Banerjee & Yuill, 1999; Denham, Cook & Zoller, 1992) or that school-aged boys outperform girls (Laible & Thompson, 1998; Whissell & Nicholson, 1991).

Regarding gender differences among shy/non-shy children, there is accumulating evidence to suggest that due to societal expectations, shyness may hold more negative psychological implications for boys than for girls (e.g., Rubin et al., 2002). That is, given societal stereotypic gender-role expectations, some adults may perceive shyness as a more stereotypic "feminine" trait and thus some adults may be more likely to accept and reward shyness in girls as compared to boys. In contrast, for boys, some adults may perceive shyness as a negative personality characteristic, and shyness may be more likely to be discouraged among boys as compared to girls. However, the majority of researchers interested in exploring gender differences have either a) investigated parent-child conversations regarding emotions, but not teachers' beliefs of students' emotional competence (Parent et al., 1999); or b) investigated teachers' beliefs and expectations of their children's emotional development, but not the connections to language ability and self-perceptions (Hughes, Deater-Deckard & Cutting, 1999), or c) investigated self-perceptions, socioemotional

competence and language abilities in typical children (i.e., labelled as not shy) (Verschueren, Buyck, Moarcoen, 2001).

The Present Study

To date, there remains little research on the gender-related differences among shy children's socioemotional and language competencies, and self-perceptions within a Canadian context (Coplan & Arbeau, 2008). Given this gap in the literature, the present study focused on the role that gender and shyness play in Canadian children' socioemotional competencies, self-perceptions, and receptive vocabulary ability. To explore the emotional landscape of children's social worlds, and illustrate the gendered relations among emotional competence, self-perceptions, and language. Given the lack of studies that compare similar classrooms across US and Canada – especially as the population of North America continues to expand and diversify ethnically and morally. Thus, within the Canadian school context only (Denham et al., 2003), this research aims to promote educational programs that foster the foundation of the learner where the child and teacher collaborate in a learning program to foster socioemotional competencies in Canadian school-aged girls and boys.

This study investigated the various conceptual mechanisms that may underlie this association between social cognitions and social withdrawal. For example, global biases and deficits in sociognitive processing may contribute generally towards social maladjustment. Researchers suggest that socially withdrawn children may differ in their ability to act upon their prosocial cognitions due to poor emotional regulation and social inhibition (Rubin et al., 2002). That is, shy children may process social situations similarly to non-shy peers, but lack the ability to sufficiently regulate their emotions in the face of arousing social situations. Thus, as Wichmann, Coplan, and Daniels (2004) suggest, shy Canadian children may evidence a performance rather than a competence deficit. Building on previous literature that shows shy children may be more likely to be more depressed, anxious and hold more negative self-perceptions than their non-shy agemates (Rubin, Burgess & Coplan, 2002), the present study explored the connections among self-perceptions, socioemotional competencies, and receptive vocabulary ability in Canadian school-aged children. Perhaps such negative self-perceptions or lack of self-worth and confidence may underlie deficits in effective social performance.

This study explored the role gender plays in the connections among socioemotional competence, self-perceptions, and receptive vocabulary ability among shy or socially withdrawn children. This study explored shy and non-shy children's responses (i.e., general pattern of responses and gender-related differences) regarding: 1) self-perceptions; 2) teachers' perceptions of students' social and emotional competence, and 3) language competence as defined by receptive vocabulary ability. Based on past gender research (Saarni; 1999), gender-related differences in the findings were expected to reflect stereotypic gender role expectations. That is, given that social reticience or passivity, emotion understanding and vocabulary ability are considered to be stereotypically feminine traits (Maccoby, 1998), girls were expected to receive significantly higher teacher ratings than boys on socioemotional competence and score higher than boys on the vocabulary task. Further, based on past research which suggests that shy boys are a greater risk for socioemotional problems than shy girls (Coplan & Armer. 2005), this study explored the question of whether or not this gender difference would be accentuated among children rated as shy by their teachers? For example, it was hypothesized that shy girls compared to shy boys would be rated by teachers as more socially competent, report a more positive sense of self, and score higher on the vocabulary task. Similarly, it was hypothesized that correlational patterns

found among children' socioemotional competence. self-perceptions, and vocabulary ability would differ according to gender and shyness.

Method

Participants

As part of a larger study of children' s social understanding and social behaviour during the middle childhood years, 91 children (52 females, *M* = 6y, 4m; 39 males, *M* = 6 y; 3m**)** and their teachers (*N*=8, females) were recruited from two schools within a mainly English-speaking, Euro-Canadian, middle SES population, in Ontario, Canada.

Measures

Self-Concept. To assess children's perceptions of their competencies, subscales from Harter's (1985) Self-Perception Profile for Children (SPPC) were used.

Based on past literature (Harter, 1999), the present study focused on three aspects that some researchers consider particularly relevant to children's sense of self including: perceived behavioural conduct (6 items, e.g., "how well-behaved do you think you are," Cronbach's alpha = .81), physical appearance (6 items, e.g., "how good-looking do you think you are," Cronbach's alpha = .79), and global self-worth (6 items, e,g., "how happy are you being who you are?" Cronbach's alpha = .89)

Teacher ratings of children's social relational competencies. Standardized, psychometrically robust rating scales were used to assess teachers' ratings of children's social behaviour, physical and psychological or relational or social aggression (Crick & Nelson, 2002; Harter, 1985; Ladd & Profilet, 1996). Borrowing from Cassidy and Asher's (1992) teacher rating scale (Child Behavior Scale), teachers were asked to rate children's behaviour on a 59-item, 3-point scale on dimensions of aggressiveness (7 items, e.g.,"fights with other children,"Cronbach's alpha = .79), disruptiveness/hyperactivity (4 items, e.g., "restless, runs about or jumps up and down, doesn't keep still), Cronbach's alpha = .94), shyness/withdrawal (e.g., 17 items composite score including items to assess peer exclusion (7 items), anxiety and fearfulness (4 items), and asocial with peers (6 items) Cronbach's alpha for composite score = .86) and sociability (e.g., "Cooperative with peers," Cronbach's alpha = .86).

Teachers' ratings of children's social behaviour was assessed with the Children's Social Behavior Scale – Teacher Form (Crick, 1996; Harter, 1985). This 15 item rating form assesses children on a 5-point scale regarding relational aggression (7 items e.g., "This child tries to exclude certain peers from peer group activities,"Cronbach's alpha =.92); physical aggression (4 items, "This child hits, shoves, or pushes peers," Cronbach's alpha = .78); and Prosocial Behavior (4 items, "This child is kind to peers," Cronbach's alpha = .89). In addition, teachers rated children's academic performance on specific disciplines such as language arts, sciences, mathematics, arts (1-item each with the child rated on a scale from 1 to 5. Scores were summed to create an aggregate, 4-item academic competence scale, Cronbach's alpha = .93).

*Teacher ratings of emotional competence***.** (Cassidy et al., 1992; Dunn & Hughes, 1998)**.** Due to the dearth of teacher rating scales of emotional maturity of school-aged children, a rating scale based on Denham's (1998) characterization of emotional competence was designed for this study (Children's Emotional Competence Scale for Teachers – CECS-T). In particular, teachers completed a 12-item rating scale of children's behaviour within the classroom (e.,g., "this child understands others' emotional states such as knowing that the teacher's smile as she comes in to the classroom means that she is feeling happy"; Cronbach's alpha = .88).

*Peabody Picture Vocabulary Test (PPVT-III, Dunn & Dunn, 1997)***.** This standardized pencil and paper task assesses children's general verbal ability. This test requires children to point to the pictures that correctly illustrate vocabulary items read by the researcher. High correlations have been found to exist between scores on the PPVT with scores on the verbal components of standardized intelligence tests. The PPVT is frequently used within developmental and educational research.

Design and Procedure

Upon receiving ethical clearance from university and school officials, this study consisted of two stages; the first stage consisted of a group, in-class session where children were group administered tasks regarding self-perceptions. Demographic information pertaining to family structure was obtained through parent questionnaire. The second stage involved an individual session in which children were administered a standardized language measure. Following the second stage of the study, teachers completed the questionnaires individually, during their own time, regarding children's social behaviours and socioemotional competencies.

Results

Preliminary Analyses

An extreme-groups method was used to categorize children as either shy or non-shy based Cassidy and Asher's (1992) Child Behaviour Scale scores. Shy children had social-withdrawal scores in the top thirty percentile and disruptiveness/aggression scores in the bottom thirty percentile (n = 26; 16 girls, 10 boys), with the remainder of the children representing the comparison group (n = 65, 36 girls, 28 boys).

To address the ongoing debate in the literature as to whether or not shyness should be conceptualized as either a category to which one does or does not belong (Kagan & Snidman, 2004), or as a dimension to which an individual varies on a continuum (see Crozier, 2001, for a review), bivariate correlations were tested with shyness/social withdrawal and the main outcome variables with shyness as a continuous variable (not a dimension or categorical variable). Among boys only (n=39), teachers' ratings of emotional competence and shyness/social withdrawal ratings were negatively related, whereas among girls (n=52), there was no relation (-.411, .055 respectively, $p < .05$). Among boys only, shyness/social withdrawal ratings were associated with relational aggression, physical aggression and social behaviour (r = -.323, .55, -.35 respectively).

Family Background, Teacher Ratings, and Vocabulary Ability

Sociometric status and family structure variables also revealed distinct patterns of associations. Overall, both the mother and father's education level was not related to children's vocabulary ability. However, separate correlational analyses conducted on the shy/non-shy groups showed a marginal positive correlation between mother's education level and vocabulary for shy boys only ($r(9) = .55$, $p < 01$). Among girls only, the number of older siblings was positively associated with receptive vocabulary ability ($r(50) = .28$, $p < .05$). That is, as the number of older siblings in girls' families increased, their scores on the receptive vocabulary task also increased reflecting a higher receptive vocabulary ability. Among boys only, the number of older siblings was negatively associated with teacher ratings of school academic competence ($r(37) = -.43$, $p < .01$). That is, teachers' ratings of academic competence increased as the reported number of boys' older siblings decreased.

Table 1. *Means, Standard Deviations as a Function of Shyness and Gender*

Variables	Girls		Boys		Main effects		
	Shy (n=16) *M (SD)*	Non-shy (n=36) *M (SD)*	Shy (n=10) *M (SD)*	Non-shy (n=28) *M (SD)*	Gender *F*(3, 91)	Shyness *F*(3, 91)	Interaction *F*(3, 91)
1. Behavioral Conduct	18.31 (3.84)	19.56 (2.68)	19.10 (2.86)	19.50 (4.36)	.19	.97	.26
2. Appearance	17.06 (4.37)	18.90 (3.50)	18.40 (3.94)	17.04 (4.60)	.07	.06	2.73
3. Global Self-Worth	17.18 (4.03)	18.28 (3.63)	19.5 (2.68)	18.14 (3.79)	2.07	.11	2.55
4. Prosocial	16.88 (2.83) $_{a}$	16.63 (2.84) $_{a}$	12.30 (3.13) $_{b}$	15.07 (3.56) $_{a}$	17.26***	2.94 ^{M}	4.14*
5. Relational Aggression	27.06 (4.19) $_{a}$	26.40 (4.92) $_{a}$	19.10 (4.43) $_{ab}$	25.11 (5.62) $_{ac}$	15.07***	5.04 *	7.76**
6. Physical Aggression	5.38 (2.62) $_{a}$	4.86 (2.11) $_{a}$	7.06 (2.75) $_{b}$	4.96 (1.75) $_{a}$	5.01*	9.18**	2.90 ^{M}
7. Emotional Competence	37.94 (5.40) $_{a}$	37.67 (6.57) $_{a}$	26.80 (5.65) $_{b}$	35.57 (7.14) $_{a}$	2.14	.88	8.60**
8. Academic Competence	12.62 (3.30)	11.91 (9.2)	9.40 (3.71)	10.75 (3.63)	4.52	.10	1.70
9. PPVT 98.25 (17.55)	103.14 (12.59)	98.25 (17.54)	103.46 (14.90)	1.11	.04	3.12^{M}	

Note. [1] = Means with different subscripts differ at the $p < .05$ level. *** $p < .001$.M = p <.20.

Table 2. *Correlations Among Self-Perceptions, PPVT, and Teacher Ratings of Socioemotional Competence*

Variables	1	2	3	4	5	6	7	8	9
1. Self-Behavioral Conduct	---	.50***	.49	.19	.02	-.16	.04	.11	.13
2. Self-Physical Appearance		---	.38***	.01	.06	-.06	.10	.13	.00
3. Global Self-Worth			---	.04	-.06	-.23*	-.02	.09	.04
4. Teacher - Prosocial				---	.28***	-.24*	.55***	.16	.01
5. Teacher - Relational Aggression					---	-.36**	.97***	.37***	.18 M
6. Teacher - Physical Aggression						---	-.40***	-.03	-.03
7. Teacher - Emotional Competence							---	.37***	.19 M
8. Teacher - Academic Competence								---	.01
9. PPVT									---

Note. $N = 91$. *** $p < .001$, ** $p < .01$, * $p < .05$, $M = p < .10$

Gender-Related Differences Across Shy/Non-Shy Groups

Table 1 shows gender differences among various measures and teacher ratings, were assessed by 2 x 2 ANOVAS (Gender x Group) performed on the PPVT and CEST. Marginal interaction effects (Gender x Shy Group) were found for the PPVT (F (1, 90) = 3.165, $p < .10$) with shy boys scoring higher than shy girls (M=110.6 and 98.3, $p < .10$ respectively). Significant interaction effects (Gender X Shy Group) were found for the CECS-T (F (1, 90) = 8.60, $p < .01$), with shy girls (M=37.94) scoring higher than shy boys (M=26.80).

Examination of the means of the study variables revealed significant and marginal differences between the four groups (shy boys, non-shy boys, shy girls, non-shy girls). The main results are summarized in the following section.

Gender differences among PPVT and Emotion Competence Scale Teacher (CECS-T) ratings revealed that shy boys received the lowest teacher ratings regarding emotional competence, whereas non-shy boys, came third, and girls received the highest scores (no distinction between shy/non-shy). Regarding vocabulary scores, boys received the highest language scores (no distinction between shy/non-shy), followed next by non-shy girls with the shy girls receiving the lowest vocabulary scores.

Across the four groups**,** shy girls received the highest emotional competence teacher ratings (M=37.9) and scored the lowest on the vocabulary task (M=98.3). In contrast, shy boys scored the highest on the vocabulary task (M=110.6), and received the lowest emotional competence ratings (M=26.8), (the reverse pattern compared to shy girls). Shy girls reported the lowest feelings of self-worth (M=18.6), whereas across all four groups, non-shy girls reported the highest feelings of self-worth (M=20.17). No differences occurred between perceived self-worth among shy (M=19.7) and non-shy boys (M=19.04).

Teacher Ratings of Prosocial and Aggressive Behaviour (CSBS-T)

To test for group differences in teacher ratings of prosocial and aggressive behaviors, a two-way MANOVA was conducted with Gender (Girl X Boy) and Group (Shy X Non-Shy) as the independent variables and the scores for the teacher rating scales served as the dependent variables (Relational or social aggression, Physical aggression, and prosocial aggression score). Means and standard deviations are displayed in Table 1. Results indicated a significant multivariate effect (Wilk's Lambda) for Group (F(3, 87) = 3.74, $p < .05$), Gender (F(3, 87) = 7.38, $p < .001$), and Gender X Group Interactions (F(3, 87) = 3.22, $p < .05$. Examination of the univariate results for gender revealed that compared to boys, girls were rated by their teachers as more aggressive, and that overall, compared to non-shy children, shy children were rated by their teachers as more aggressive (see Table 1).

Further examination of the means showed that shy girls were rated as the most relationally or socially aggressive, whereas shy boys were rated as the most physically aggressive and the least relationally aggressive (see Table 1). Interestingly, shy girls also received the highest prosocial teacher ratings compared to shy boys who received the lowest prosocial ratings.

Vocabulary, Emotional competence, Self-Worth and Gender

Table 2 shows the bivariate pearson intercorrelations for the main variables for the whole sample (N=91). A marginal positive correlation was found between PPVT scores, emotional competence and relational aggression ratings which illustrates how general vocabulary ability is marginally related to how teachers' view children as emotionally competence and relationally aggressive. Separate correlational analyses conducted on boys and girls, and also on the four groups (shy girls, shy boys, non-shy girls, non-shy boys) revealed a significant positive correlation between vocabulary ability and emotion understanding for girls only

(shy and non-shy; r(50) = .34, $p < .01$; boys $r(37) = .07$, ns), which suggests that higher ratings of emotional competence are related to higher levels of general vocabulary ability.

Among the total group of boys (shy and non-shy), teacher ratings of emotional competence (CEST) were marginally negatively related to boys' global self-worth ($r(37) = -.28$, $p < .10$). In contrast, among the total group of girls (shy and non-shy), teacher ratings of emotional competence were marginally positively related to feelings of global self-worth ($r(50) = .24$, $p < .10$). *Perceptions of Self-worth, Vocabulary ability, and Teachers' Ratings of Academic competence: Gender Differences and Patterns*

Table 1 also shows the ANOVA results illustrating that shy girls received the highest emotional competence ratings with shy girls (M=37.94) receiving significantly higher teacher ratings of emotional competence compared to shy boys (M=9.40). (see Table 1). Although there were no significant gender differences, further examination of the mean self-perception scores showed interesting patterns among the self-perceptions scores across the four groups. In particular, shy girls reported the lowest global self-worth (M=17.19) and shy boys the highest (M=19.30). Similarly, although no significant differences were found across groups and gender, interesting patterns emerged across the four groups regarding teachers' ratings of academic competence and PPVT scores. Specifically, shy girls received the highest teacher academic competence ratings (M=12.62) and scored the lowest on the PPVT (M=93.25), whereas the opposite pattern emerged for shy boys. That is, shy boys received the lowest academic competence ratings (M=9.40) and scored the highest on the PPVT vocabulary task (M=103.46).

Additional correlations conducted for the shy groups (both girls and boys) showed that a significant correlation was found between shy boys' global self-worth and their scores on the PPVT ($r(8) = .764$, $p < .05$). That is, shy boys' perceptions of their general self-worth, or how happy they are with themselves, increased as their language skills increased. Further gendered patterns of associations among shy and non-shy groups revealed that non-shy groups revealed that non-shy boys' perceptions of self-worth were not related to general language ability ($r(37) = -.035$, *ns*). Among shy and non-shy girls, PPVT scores were not related to global self-worth ($r(15) = -.07$, $r(34) = .05$, *ns*, respectively).

Table 2 shows the intercorrelations among the main variables for the total sample. Table 2 shows a significant negative correlation between children's perceptions of global self-worth and teacher ratings of physical aggression ($r(89) = -.28$, $p < .001$). That is, the higher the teachers rated the children on exhibiting acts of physical aggression, the lower the children rated themselves regarding global self-worth. Although Table 2 shows that no correlation was found between teacher ratings of relational aggression and global self-worth for the total sample (N=91), further correlational analyses conducted on each group showed that significantly different gender correlational patterns emerged for girls and boys regarding these variables (Fisher's Z test, $z = 2.85$, $p < .05$). More specifically, a significant negative correlation was found between teachers' perceptions of relational aggression and perceived global self-worth for the total group of boys ($r(37) = -.34$, $p < .05$) as compared to a nonsignificant relation for the total group of girls ($r(50) = .23$, *ns*). That is, for boys only, higher teacher ratings of relational or social aggression were related to lower scores of perceived global self-worth.

Regarding associations between teachers' ratings of academic competence and children's perceived self-worth, among the total group of girls, a significant positive relation was found between teacher ratings of academic competence and perceived self-worth ($r(50) = .34$, $p < .05$; for boys, $r(38) = -.19$ *ns*). Fisher's Z test revealed that these correlations differed significantly ($z = 2.41$, $p < .05$). That is, girls but not boys who viewed themselves positively

were rated by their teachers as more academically competent. Further correlational analyses conducted within-gender groups revealed significant positive relations for shy girls' only (r(14) .624, $p < .01$). No relations were found between boys' (shy and non-shy) and non-shy girls' perceived self-worth and teachers' ratings of their academic ability.

For girls only, a significant positive relation was found between teacher ratings of academic competence and perceived self-worth (r(50) = .34, $p < .05$; for boys, r (38) = -.19 *ns*). Fisher's Z test revealed that these correlations differed significantly ($z = 2.41$, $p < .05$). That is, girls with positive self-views were rated by their teachers as more academically competent. Further correlational analyses conducted within-gender groups revealed significant positive relations for shy girls' only (r(14) .624, $p < .01$). No relations were found between boys' (shy and non-shy) and non-shy girls' perceived self-worth and teachers' ratings of their academic ability.

Table 2 shows a marginally significant positive relation (r(89) = .19, $p <$. 10) between teacher ratings of children's emotional competence and PPVT scores, suggesting that children who received higher teacher ratings of emotional competence were more likely to score higher on the receptive vocabulary task. Separate correlational analyses conducted for girls and boys on these variables revealed a significant positive relation for girls only (r(50) = .39, $p <$ .01; boys (r(38) =.08, *ns*).

Discussion

This study explored the role gender plays in the associations among teachers' perceptions of socially withdrawn or shy Canadian children's socioemotional competence, children's self-perceptions, and receptive language ability. Findings suggest that the child's gender may influence teachers' perceptions of socioemotional competence. In particular, significantly different patterns of associations were found among children's self-perceptions and teacher ratings of relational aggression, emotional competence, and academic competence for shy/withdrawn girls and boys. Significant gender differences were also found among patterns of associations between relational aggression and emotional competence, self-perceptions, and receptive vocabulary. The theoretical and educational implications of these findings are discussed below.

Teachers' Perceptions of Children's Socioemotional Competencies and Self-Perceptions

The gender-related differences in the relations among teachers' perceptions of children's socioemotional competencies and self-perceptions suggest that shy girls may be more influenced and/or sensitive to teachers' perceptions and expectations than shy boys. Findings suggest that shy girls' self-perceptions may be influenced by teacher ratings of academic competence and this is consistent with Dunn's (2005) claim that a sophisticated ability to understand mental states and emotions in others may have some psychological costs as well as benefits in that some children may be more sensitive to teachers' criticisms as compared to other children who do not have such a well developed ability. In the present study, given that the shy girls were rated by their teachers as the most emotionally competent compared to shy and non-shy girls and boys, perhaps shy girls' self-perceptions are more likely to be influenced by their teachers' comments (both positive and negative). Overall, these findings are also consistent with past research that suggests teachers' expectations and beliefs of students may influence students' self-perceptions and behaviors within the classroom (e.g, Curtis & Altmann, 1977; Purkey, 2000). However, as the present results illustrate, children's perceptions and teacher ratings were not always in agreement, and this lack of concordance needs to be addressed in future research as this difference in perceptions may have implications for students' learning.

The present results also support the past research which suggests that compared to shy girls, shy boys may be the greatest at-risk for the development of socioemotional difficulties (e.g., Coplan & Armer, 2005). Also, the present findings suggest that language may play a larger role in shy boys' developing sense of self-worth. That is, given that shy boys scored the highest on general language ability, but were rated as the least emotionally competent by their teachers and received the highest aggression ratings but the lowest prosocial ratings, and that positive relations between receptive vocabulary ability and emotional competence were found for shy boys only supports Coplan & Armer's (2005) claims that increased vocabulary ability might be particularly helpful for shyer children (especially boys) in terms of facilitating social interaction. Interestingly, the reverse pattern was found shy girls in that they scored the lowest on receptive vocabulary scores, and received the highest prosocial and relational aggression ratings.

Teacher Perceptions and Students' Perceived Self-Worth

How do we explain the finding that the relation between teachers' perceptions of children's emotional competence and children's perceptions of self-worth was positive for girls' self-worth, but this relation was negative for boys? As discussed earlier in this paper, from a psychocultural perspective, these findings could be explained in terms of North American stereotypic societal gender-role expectations. That is, perhaps the findings reflect North American, particularly Canadian stereotypic societal gender-role expectations that place a greater value on emotional competence among women as compared to men. Given that girls have learned to expect that understanding emotional worlds is an expectation of their gender, competence in this "emotion reading skill" would be more likely to increase someone's sense of self-worth. However, if this skill is considered gender-inappropriate, emotional competence may have a negative influence on a boy's sense of self-worth.

Shyness, Language, and Gender-Related Differences in Emotional Competence

The present findings suggest that the complex connections exist among receptive vocabulary ability, perceived self-worth, and teacher ratings of emotional competence may differ according to gender and shyness. Such findings support previous research (e.g, Cutting & Dunn, 1999; de Villiers, 1999) and theorists' claims that language and social interaction play significant roles in children' emotion understanding (e.g., Bruner, 1996). However, gender analyses revealed that the relation between vocabulary ability and perceived self-worth remained significant for shy boys only. Thus, compared to girls, general vocabulary ability may play a larger role in boys' self-development.

The results from the present study partially support research that suggests that shy boys might have greater psychological costs due to cultural stigmas attached to stereotypic gender-role expectations and behaviour (Coplan & Arbeau, 2008), and furthers this claim by showing that there may also be some psychological costs for shy girls. Thus, as mentioned earlier, the present findings add to the growing body of contradictory empirical evidence regarding gender differences in the experiences of shyness, self-perceptions, and socioemotional competence in middle childhood.

The language differences across shy and non-shy girls and boys, particularly the finding that shy girls scored the lowest on the language measure whereas shy boys scored the highest supports past research which shows that some socially withdrawn children may experience restrictions in their verbal communication (Schneider, 1999). In contrast to past research (e.g., Rubin, Chen & Hymel, 1993), shy boys scored the highest on the self-perceptions, and the highest on the language measure, but the lowest emotional competence ratings. Further, teachers rated shy boys as the most aggressive group, and according to the self-

socialization theory (Maccoby, 1998), these teacher perceptions may also influence the boys' self-perceptions and possible aggressive behaviours.

Past research may help to explain the question of why would vocabulary ability be linked to perceived self-worth for shy boys only, and why did shy girls score the lowest on the receptive vocabulary task, whereas shy boys scored the highest? Although Cutting and Dunn (1999) found a similar result (receptive vocabulary ability was related to false belief understanding for boys only), they claimed that the finding required replication before it could be interpreted. The present findings suggest that perhaps receptive vocabulary ability plays a larger role in boys' self development than in girls. Thus, although boys may not be able to express their emotion knowledge verbally, perhaps they are capable of understanding the emotion concepts. In contrast, perhaps expressive language ability plays a greater role in girls' emotional development and sense of self. This finding also supports Coplan and Armer's (2005) claim that increased vocabulary ability might be particularly helpful for shyer children (especially boys) in terms of facilitating healthy social interactions.

The finding that girls, as compared to shy boys, receive higher ratings in emotional and social competence and academic ratings but also receive the highest relational aggression rating support the ongoing debate as to whether or not gender plays a role in shy children's social and emotional competencies. For example, past research that has shown school-aged girls score higher than boys on emotion understanding, particularly the complex, moral emotions (Bybee, 1998; Cutting & Dunn, 1999), but contradicts research that found American preschool-aged boys scored higher than girls (Laible & Thompson, 1998). This gender-related difference also supports related studies within the United Kingdom that have shown that girls scored higher than boys in emotion understanding (e.g., Cutting & Dunn, 1999). Thus, the present study adds to the growing number of studies that demonstrate the contradictory research on the gender-related differences in the area of mental state attribution or psychological mindedness and the psychosocial implications of such an ability (Hughes & Dunn, 1999).

Such findings also support the notion that perhaps sophisticated, or advanced emotional competence may have both intrapersonal and interpersonal costs and benefits (Cutting & Dunn, 1999; Sutton et al, 1999). For example, regarding interpersonal implications, children with a highly advanced emotional understanding ability may also use this ability to harm others such as excluding certain peers from a group by developing friendship with someone else (Sutton, et al., 1999). As Dunn (1995) reminds us, a child's ability to understand someone's emotional state does not tell us how that child may choose to behave socially. Another explanation for the contradictory teacher ratings about shy girls' behaviours is perhaps that due to the subtle nature of relational aggression (e.g., smiling at someone while writing her/him a hate letter?), teachers reported contradictory behaviours exhibited by girls in the classroom (Crick & Nelson, 2002).

Parent-child and/or teacher-child emotion talk can also be considered as a possible explanation. As Fivush (1989) found in her study, mothers focused more on causal explanations of emotions with young boys and used more emotion labels than explanations with girls. Perhaps such gendered emotion parent-child talk influenced the responses of the children in the present study. That is, perhaps the mothers in the present study focused more on emotions in conversations with their daughters as compared to their sons. During the grade school years, in addition to parents, teachers also play a crucial role in shaping their students' self-concepts and competencies (Denham, 1998; Purkey, 2000). For example, educators and parents could serve as socioemotional and linguistic "coaches" by providing a supportive scaffold (in the Vygotskian sense) that could be used to facilitate children's

socioemotional and linguistic competence, which in turn may lead to a greater sense of self-worth.

Implications and Future Directions

The illustration of gender patterns among socioemotional competence, self-perceptions, and receptive vocabulary ability highlights the need for future research to include the role of gender and language when exploring the connections among shyness, self-perceptions, and teacher ratings of students' social and emotional competencies during the middle childhood years. The positive association found between shy boys' vocabulary ability and their perceived self-worth suggests that receptive vocabulary ability may play a supporting role in boys' developing sense of self-worth during middle childhood. That is, although language may provide a vehicle through which the theories of self, others' minds and feelings are created (e.g., Bruner & Kalmar, 1997), our findings suggest that receptive vocabulary ability may be of greater use in the creation of self-scripts or schemas for shy boys than shy girls. Language played a stronger role in teachers' ratings of girls' emotional competencies than boys – both non-shy and shy. Consequently, researchers and educators need to draw from psycho-linguistic and cross-cultural literature (e.g., Salovey & Sluyter, 1997; Vinden, 1999), and begin to integrate language tasks (both receptive and expressive) into socioemotional and self-concept research with children across various cultures, as well as educational programs aimed to develop emotional literacy as a means of coping with social anxiety in the classroom.

Given the limitations of the present study (e.g., correlational design, lack of general intelligence measure, ethnically homogeneous sample), interpretations of the present findings are to be made with caution. Given the complex process of the co-construction of emotions and self-concept, paper-and-pencil tasks such as the SPPC and teacher reports are unlikely to capture such a dynamic and complex process. Future studies could provide more explicit training for teachers to report and rate shy and socially withdrawn behaviour in their students, and the addition of parental ratings of shy or socially withdrawn behaviour would also provide a more accurate description of a child's behaviours both in the school and home context. With research on teachers' perceptions of shy children' s emotional competence still in its infancy, this study may provide a starting point for future research on shy children's emotional competence within the school setting to include observational measures in naturalistic settings such as discourse analysis of peer conversations on the playground and parent-child/ child-sibling conversation.

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