

Effects of A Universal Design for Learning Based Literature Circle Model on Higher-Order Reading Comprehension Skills and Student Engagement

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Abstract

Outcomes related to students' higher-order reading comprehension skills and their academic and intellectual engagement, following the implementation of a UDL-based literature circles pedagogical model were investigated in this mixed design study. Fifty-nine students attending three public middle schools took part in this study. Quantitative data were collected from all the 59 students, while qualitative data were collected from a purposively selected sub-sample of 24 students. Quantitative and qualitative data were analyzed using repeated measures (MANOVA) and a case study approach, respectively. Quantitative results indicated a small but significant increase in reading comprehension outcomes for proficient and typical readers in treatment groups compared to control classes, and a significantly greater increase in reading comprehension outcomes for students who were culturally and linguistically diverse struggling readers in treatment classes. Qualitative results indicated that students' academic and intellectual engagement increased in the treatment classes for both proficient and struggling readers.

Introduction

As we enter the second decade of the 21st century, Canadian schools continue to reflect the increasing diversity of our society in terms of culture, ethnicity, language, ability, and other characteristics. While students from diverse cultural backgrounds enrich the experience and discourse of Canadian classrooms, concerns regarding these changing demographics are underscored by the poor academic outcomes of students from language minority backgrounds (Lee, 2002). Culturally and linguistically diverse (CLD) is an educational term used by educators in the United States and Canada to identify children from homes and communities where English is not the primary language of communication (Garcia, 1991). For the purposes of this study, the operational definition of the phrase "students who are culturally and linguistically diverse (CLD)" is any student whose primary language or languages of the home, is/are other than English and would require additional English language support to develop reading, writing, listening and speaking skills in English. Students who are CLD come from a range of cultural backgrounds. They bring with them a variety of educational, social and personal experiences as well as varying levels of English language proficiency.

These students first learned to speak, read and/or write a language other than English and have a level of English language proficiency that impedes them from full participation in the learning experiences provided in Canadian schools. Research indicates that for the past 25 years, children who are culturally and linguistically diverse and exhibit a limited English-language proficiency have been underperforming academically in comparison with their English-speaking counterparts, and are failing to integrate meaningfully into the economy in large measure because of this (Zong, 2004).

Creating inclusive environments as well as implementing instructional pedagogies to support curricular outcomes for this diverse student population has become essential for classroom teachers (Gonzalez, Pagan, Wendell & Love, 2011). In fact, as has been shown by Gonzalez et al. (2011) research identifies the fundamental need for instructional strategies that will support students who are CLD who struggle with literacy and content area academic needs such as lack of reading experience or low vocabulary development (Gonzalez, Pagan, Wendell & Love, 2011) or those who struggle with reading for reasons of disability (Shanahan & Shanahan, 2008), as a priority for educators. Gonzales et al. (2011) also noted that although many strategies for supporting native English speakers are

applicable to the CLD population, significant differences exist in the way that instruction must be designed for students who are CLD to achieve academic success.

Many researchers specializing in second language (L2) student populations today call for abandoning traditional instruction that involves reductionistic skill-building activities (Au & Raphael, 2000; Carrasquillo et al., 2004; Carrasquillo & Rodriguez, 2002; Cummins, 2002; Freeman & Freeman, 2003; Linan-Thompson, Vaughn, Hickman-Davis & Kouzekanani, 2003; Peregoy & Boyle, 2000; Watts-Trafte & Truscott, 2000). Instead, they support approaches that encourage a metacognitive and constructive model such as discovery, hands-on, experiential, and collaborative, project-based, and task-based learning. Cognitive research has established that explicit teaching of metacognitive reading comprehension strategies used by proficient readers improves the reading comprehension abilities of struggling or less proficient readers (Braunger & Lewis, 1997; Dole et al., 1991; Kucan & Beck, 1997; Pressley, 2000). Cognitive research therefore points to the need for a reconceptualization of reading comprehension across the curriculum (Kendeou & Trevors, 2012; Van den Broek & Espin, 2012; Van den Broek, Rapp, & Kendeou, 2005). This reinforces the need for research that informs the accurate identification and assessment of struggling students who are CLD, as well as the design of specific instructional programs to meet their particular needs. This study was designed to investigate the effects of a universally designed literature circles pedagogy on the reading comprehension, higher-order critical thinking, and engagement of culturally and academically diverse sixth and seventh grade classes including both proficient readers, and students who are culturally and linguistically diverse (CLD/EAL) and are struggling readers.

Student Engagement

There is growing consensus among researchers that students who are highly engaged at school learn more, get higher grades, and more often pursue higher education (Park, Holloway, Arendtsz, Bempechat, & Li, 2012). Findings from studies that have put students in active learning situations support the benefits of participatory engagement (Smith & Cardaciotto, 2011; Yoder & Hochevar,

2005). Instructional methods that include small group work, differentiated tasks, and peer interactions have been shown to increase student engagement (Katz, 2013). Given that concerns have been raised about the engagement and success of students who are CLD, this study focused on two dimensions of student engagement – academic and intellectual engagement of students who are proficient readers and students who are CLD and are struggling readers in the context of a universal design for learning based literature circle intervention in grade six and seven classrooms.

The Three-Block Model of Universal Design for Learning (UDL)

To ensure that all students have genuine opportunities to learn in standards-based settings, educators need to develop a new kind of approach to learner differences. In other words, in looking for ways to create inclusivity amongst all learners, including proficient readers as well as English as an Additional Language (EAL) learners in high-quality, standards-based educational settings, educators and researchers should look for ways in which the curriculum presents barriers and supports to academic achievement for diverse learners and how the curriculum can be redesigned to include all learners from the inception. One possible model of instructional planning that addresses both the academic and social needs of all students in inclusive classrooms and facilitates access, participation, and progress for all learners is the Three-Block Model of UDL (Katz, 2012). According to Katz (2012), the Three-Block Model is a UDL framework that integrates decades of research on inclusive educational practice and key strategies such as differentiated instruction, understanding by design, assessment for learning, inquiry, literature circles, performance assessment, student self-assessment, democratic classrooms, class meetings, and communities of care. Katz, (2012) delineates three main components (blocks) of UDL that provide teachers with a system for creating inclusive environments and enhancing student engagement. The three blocks include: (1) building compassionate learning communities, that is, ensuring positive social and emotional learning influences on the climate of school and classroom; (2) inclusive instructional practice; and (3) systems and structures that support inclusive learning communities.

A Universal Design for Learning Based Literature Circles Model (UDL-LC)

Literature circles are an opportunity for students to talk with their classmates about what they are reading in small groups, where all voices are respected and heard and where all students are included. In this way, students are engaged in making sense of the text, creating images, asking questions, making connections, drawing inferences, predicting, analyzing, synthesizing, and responding emotionally. This study integrated the principles of the Three-Block Model of Universal Design for Learning (UDL) (Katz, 2012) and research-based literature circles adapted from Faye Brownlie's literature circles (Brownlie, 2005) to form a unique UDL-based literature circles pedagogical model (UDL-LC). Its design utilizes flexible groupings, allowing the classroom teacher to differentiate literacy instruction for all students, while students meet in literary discussion groups to dialogue about what they have read in order to collectively construct meanings from the text.

This UDL-LC pedagogical model utilizes the Three-Block Model of Universal Design for Learning framework as an approach to planning curricula—including instructional goals, methods, materials, and assessments—that are sufficiently flexible from the foundation to accommodate learner differences (Katz, 2012; Meyer & Rose, 1998). The UDL-LC pedagogical model in this study incorporates: (a) multi-level texts and text formats (audio and digitized copies) that provide choice and appropriate challenges for a heterogeneous group of students, (b) multiple methods of text representation, expression and engagement that are flexible and diverse enough to support and challenge a diverse group of students, (c) authentic learning activities that are flexible, engaging, participatory, and meet the learning styles of all students in an inclusive classroom, and (d) authentic assessment opportunities that are adequately flexible to support ongoing, accurate information, to inform instruction and determine student understanding and knowledge.

This research study examined a problem that many general education teachers face today: how to successfully improve academic and intellectual outcomes in reading comprehension, for all students in a mainstream English-only environment. While UDL and the Three-Block model have been shown to support access, participation and progress for all

learners (Meo, 2012; Rose & Meyer, 2002), and significantly increase students' engaged behavior, and promote social engagement through increased peer interactions, student autonomy, and inclusivity (Katz, 2013), no studies have provided a comprehensive UDL-based framework that connects UDL principles with pedagogical instructional methods in reading comprehension through the use of literature circles.

Purpose of the Study

The purpose of this study was to investigate whether the application of UDL principles, and the explicit teaching of multi-text literature circle inquiries helps all students to comprehend texts, improve students' reading engagement, participation, and high-order thinking skills in an inclusive sixth and seventh grade classrooms. Specifically, the two research questions addressed in this study were:

1. Is there a significant difference in reading comprehension scores and higher-order critical thinking for students who are proficient readers and students who are culturally and linguistically diverse and struggling to acquire literacy skills, following the implementation of a UDL-based literature circle instructional pedagogy in reading comprehension?
2. Is there a significant difference in academic and intellectual engagement for students who are proficient readers and students who are culturally and linguistically diverse and struggling to acquire literacy skills, following the implementation of a UDL-based literature circle instructional pedagogy in reading comprehension?

Method

The methodology for this study consisted of a quasi-experimental, mixed design pre and post intervention program measurement using both quantitative and qualitative measures. Both quantitative and qualitative measures of the intervention focused on the reading comprehension outcomes and higher-order critical thinking skills of the students and the total effects on students' academic and intellectual engagement as a result of the intervention. Outcomes for both proficient readers and students who are CLD and are struggling

learners were compared to a control group that did not receive the treatment but rather implemented a teacher-centered pedagogical model of reading comprehension instruction. The study used classroom-based assessments and curriculum based measures to determine reading comprehension outcomes, as well as the perspectives of students regarding their academic and intellectual engagement thus incorporating a qualitative dimension. All measures were administered twice – pre and post intervention, to both treatment and control groups.

Sample

The sample for this study consisted of 59 students (18 students in two separate control classrooms/schools (grades 5 and 7) and 41 students in two separate treatment classrooms/schools (grades 6 and 7) who attended three different public schools (Grades 5, 6 and 7). They were drawn from a larger sample of four classrooms in three separate schools. However, in the context of this study, both quantitative and qualitative data on the students were collected in two sub-groups, a control group and an experimental group. For the purpose of this mixed-design study, a sub-sample consisted of 24/59 students (12 each from control and treatment classes) who were identified by the participant teachers using a purposeful criterion selection method and placed into categories (proficient readers and students who are CLD and are struggling readers) based on the schools' pre-existing classroom-based assessment and screening process. Participants were identified for this sub-sample based on the following criteria in order to create a heterogeneous and academically and culturally diverse sub-sample:

1. Group A: Students who were proficient readers, performing at least at grade level or above, and enrolled in intervention classes (6 students).

2. Group B: Students enrolled in intervention classes who were culturally and linguistically diverse (CLD), were able to communicate orally in English for social participation (i.e., they may struggle with academic terminology, but could talk to their peers and teachers), but were struggling to acquire literacy skills and were therefore attending ESL instruction (6 students).

3. Group C: Students who were proficient readers, performing at least at grade level or above, and enrolled in control classes (6 students).

4. Group D: Students enrolled in control classes who were culturally and linguistically diverse (CLD), were able to communicate orally in English for social participation (i.e., they may struggle with academic terminology, but could talk to their peers and teachers), but were struggling to acquire literacy skills and were therefore attending ESL instruction (6 students).

Independent and Dependent Variables

The independent variable in this study was the classroom pedagogy. A six-week UDL-based literature circles intervention was designed using an integrated, cross-curricular thematic framework: (3 times per week (90 minutes per day) for the treatment group, while the control group received direct instruction or a direct reading activity. The dependent variables on the other hand were the measurement of: a) reading comprehension and higher-order critical thinking skills: students were assessed based on their reading fluency and comprehension in authentic ways (prediction, silent reading and response) and b) student engagement (academic engagement and intellectual engagement).

Data Collection

The collection of quantitative data involved conducting pre and post intervention reading assessments of students in both treatment and control classes. The goal was to evaluate students' reading comprehension and higher-order thinking skills before and after the intervention (weeks 1 and 6 respectively). The measures included the following three components: (a) standard reading assessment (SRA) rubrics, (b) double entry journals and (c) comprehension performance tasks (see Figure 1).

Standard Reading Assessments (SRA). The standard reading assessments (Katz, 2013) are based on a process developed by Faye Brownlie, and the performance standard rubrics developed by the BC Ministry of Education (2013) to assess students' reading fluency and comprehension in authentic ways (see Appendix A). They are valid and reliable measures of assessment for and of learning because they help classroom teachers to monitor students' performance and independent application of skills and strategies in reading. The SRA's have three sections: 1) a prediction activity that assessed to what had regarding this particular topic/passage, 2) a silent

Week	Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation
Week 1	In sequence, list all the main events in any text you have read and create a timeline of the events.	On a poster, design an idea gram (a visual display of pictures, quotes and drawings) to represent the theme of any novel you have read.	Design a graph that shows the impact of immigration on Canadian society.	Create a song with your own lyrics that reflects the theme of immigration and its effects on quality of life in Canada. Your song must include the importance of human rights and responsibilities in guiding our decision-making as an individual and as a democratic country.	Reflect on the factors and events that have shaped Canadian life. Write your thoughts about how it makes you feel and what needs to be done to change the situation.	Interview another student and record his or her responses to these questions: 1) Describe the experiences of a new Canadian immigrant? 2) Would their life be better off in Canada or at home? Give specific examples and reasons.
Week 2	Using a fact-based sheet, write, draw and explain all the factors that help shape the life of a new Canadian immigrant. Include any questions you may have and suggestions for new immigrants.	On a poster, design an idea gram (a visual display of pictures, quotes, personal responses, and drawings) to represent the theme of “diversity and multiculturalism”	Write a script and perform a dance or a mime to act out the need to take action to support quality of life of immigrants in Canada.	Imagine you and your family are moving to Canada newly. How will your life be different? Will it be the same as it was in your homeland? Create a Venn diagram, write or draw to show the comparison and/or contrast.	Write a journal entry to reflect the changes in the feelings and emotions of any character in a novel you have read who emigrated from home. Explain how it affects them in their new country.	In Canada, citizens have rights and responsibilities. Create a role play showing how these rights and responsibilities sustain our democracy.
Week 3	Imagine that you are a new immigrant in Canada. Make a timeline of events right from your departure from your homeland to your arrival in Canada.	Make a carton strip showing the sequence of main events in any book you have read. Illustrate using pictures to represent each main event.	Create a mural (a piece of art work) to depict the diversity of people in Canada.	Based on a book you have read write a journal of the experiences of the main character during the time period discussed in the book.	Using a web search, library and media resources prepare a power point presentation on ONE historical event or invention that has helped to shape Canadian life. Your presentation should include visuals.	Write a letter to your School Principal explaining your views about the Canadian immigration policy and its impact on new immigrants. Explain how and why the policy has helped Canada to become a multicultural society.

Week 4	Make up words for a radio jingle about what “diversity and multiculturalism” means to you.	Write a poem, in any style you choose, representing your thoughts, feelings, and beliefs about the importance of rights and responsibilities of citizens in a democratic country.	Imagine your family has newly moved to Canada. Write a letter to a friend or relative in your homeland describing life in your new home. How is it similar? How is it different? Explain how you have adjusted to life in your new home.	Create a piece of Art depicting ONE Canadian invention that has helped to shape Canadian life. You may use any material (e.g., paint, plasticine, pastels), Be creative. Write a short paragraph to describe your invention.	Imagine you and your family have moved to Canada. Compose a song that expresses your thoughts and feelings about your new life now. What do you like about living there? What do you miss about life in your homeland?	What does the word multiculturalism mean to you? Draw, create an art work, and write your response.
Week 5	List your picks for the three most important scientific research and technological advancements that have helped to form Canada. Give reasons for your choice.	Design a web using the word “diversity” at the center. Include both your own general understanding of the word and as many examples as possible (e.g., different races, religions, languages).	Classify the factors that have helped to shape Canadian life. Create a web to illustrate each factor. Give examples of each factor.	Prepare a list of factors that have helped to sustain a multicultural society in Canada. Explain the reasons for your choice of factors.	What if you were the Immigration Minister of Canada! What would you propose as the solution to sustain multiculturalism in Canada?	Prepare a bibliography (a list of sources e.g. books, journal articles, Web sites, videos etc.) that you could consult in your study about “Diversity and Multiculturalism in Canada”. Describe the main idea of each source and why the source is useful.
Week 6	List your picks for the three most important events in any novel you have read. Give reasons for your choice	Design a semantic map or graphic organizer to summarize a novel you have read. Use captions and illustrations to show your understanding.	Make a carton strip to illustrate the characters and events in a novel you have read. Write a summary of your text.	Prepare a top 5 list of things you consider to be the most important for a new immigrant to Canada to do in order to become integrated into the society. Explain the reasons for your choice.	What if you were the Prime Minister of Canada; Suggest ways in which immigration may be improved within the country.	You are a participant in a class debate on the issue of immigration to Canada. Write a report to argue your case for or against the motion to your classmates.

Figure 1. Comprehension Culminating Performance Tasks

reading passage and open-ended response sheet. This authentic assessment allowed students to read the passage at their pace and as many times as they wished and respond in a variety of ways – using images, webs, charts, etc. as well as traditional paragraphs or fact based responses, and 3) a reading conference. Students read aloud a short passage, and a running record was taken to assess reading fluency and decoding strategies. This assessment was extent students activated prior knowledge before reading, and how much prior knowledge a student

administered to all students in the sample in both control and treatment classes (59 students) twice (once before the intervention and once after the intervention).

Double Entry Journals. Once a week, students in the treatment classes completed double entry journals to measure reading comprehension and higher-order critical thinking skills in response to books they had read and discussed in their groups (see Figure 2). The purpose of the response journal

What Happened?

- ❑ Accurate information
- ❑ Uses examples from the text
- ❑ Describes characters, settings using language for impact
- ❑ Describes conflicts, events accurately and powerfully
- ❑ Identifies relevant details
- ❑ Uses own words, except for quotations
- ❑ Makes the book / passage / poem sound interesting

What I Think?

- ❑ Synthesizes – summarizes and explains cause and effect
- ❑ Infers
 - Makes logical predictions
 - Discusses characters feelings, motivations, and points of view
 - Gives insight into underlying themes, author's message
- ❑ Makes connections
 - Text to self
 - Text to text
 - Text to world
- ❑ Details images – shows ability to place self within the context
 - Describes visual images, other sensory reactions (e.g. sounds, smells, tastes)
 - Discusses feelings, experiences
- ❑ Questions
 - Poses questions about events, characters' actions, feelings, author's decisions
 - Discusses areas of confusion
- ❑ Reflects and Responds
 - Gives opinions, reactions with some support (tells why, refers to sections of text)
 - Talks about personal impact on feelings, values, beliefs, knowledge

Figure 2. Double Entry Journal

was to give students time to reflect independently on their reading and practice a previously modeled reading comprehension or vocabulary development strategy. The double entry journal had two sections: a) what happened, and b) what I think. Section A sought to measure an understanding of the content of the texts read while section B measured the application of the core comprehension strategies and higher-order critical thinking skills such as students' ability to draw inferences from, and make connections to, the text. These journals were not independently quantified or analyzed. However, students' reflective or cognitive ability on these journals contributed to teachers' final assessments on the reading assessment rubrics.

Comprehension Performance Tasks. Once a week, students in the treatment classes completed one culminating comprehension performance product of their choice based on the text they were currently reading. This individual performance task or comprehension choice board was based on Bloom's taxonomy of learning domains. The goal of this measure was to generate data that reflected growth in the cognitive domain. These tasks were also not independently quantified or analyzed but they contributed to teachers' final assessments on the standard reading assessment rubrics (see Figure 1).

The Intervention

Pre-Test Intervention. Prior to the implementation of the UDL based literature circles' pedagogy, the researcher provided two after-school professional development sessions, of about 90 minutes each, specifically on UDL-based literature circle's thematic unit planning and assessment, that suited the needs of the treatment classroom teachers. The sessions included how to administer and analyze students' reading comprehension using the Standard Reading Assessment Rubrics and how to plan a UDL-based literature circles unit. Following this training, both teachers and the researcher collaborated to plan a UDL-based literature circles thematic unit (choosing texts, designing rubrics, developing and planning activities and projects that matched the grades 6 and 7 science and social studies units or curricular outcomes they were currently teaching) for the two treatment classes. By the end of week one, pre-interviews were conducted on the sub-sample of 24 students from both treatment and control groups.

Program Intervention. The literature circles framework provided a lesson planning model and organizational tool for the literature circles' intervention phase (week 2-5), using multi-leveled texts and multiple text formats selected by the treatment classroom teachers and the researcher, which matched the science and social studies units. Treatment groups met three times a cycle (Mondays, Wednesdays and Fridays) for 90-minutes each day. The intervention began each day with a 10-minute mini-lesson that included a discussion of thematic unit goals, the essential understandings and questions of the unit, application of focus comprehension strategies and literature circles' group expectations. During the next 40-minute block, students silently read and responded to texts in their literature circle groups on Mondays, Wednesdays, and Fridays. Typically, the students read silently for 20 minutes on each day, using multiple text formats and technology/materials such as digitized or scanned copies of texts, strategy stickies that helped students identify text components, and computer based Microsoft Word's insert text or audio comment features, and met in their literature circle groups or centers to talk about the text for 20 minutes. During this sharing time students worked in heterogeneous groups, discussing "what happened" and "what I think?" During the final 40-minutes block, students had three tasks to be completed in rotation, one each on Mondays, Wednesdays and Fridays. On Mondays students completed their double entry journals, on Wednesdays they completed one comprehension performance task of their choice (bloom's taxonomy comprehension choice board and on Friday they worked in their multiple intelligence centers. During the center time, each group began to work on their inquiry project. Each group had the task of presenting two culminating performance products (inquiry projects) to the entire class using any of the multiple intelligences of their choice. The first group presentations took place during the third week.

Post-Test Intervention. The final group presentations took place during the sixth and final week. During group presentations, students took part in a group discussion of the previous book that they had read. This flexibility in groupings allowed diverse learners to self-pace their learning. The classroom teacher met weekly with each literature circles' group to instruct and facilitate the negotiation of meaning among group members. At the end of group presentations, treatment group

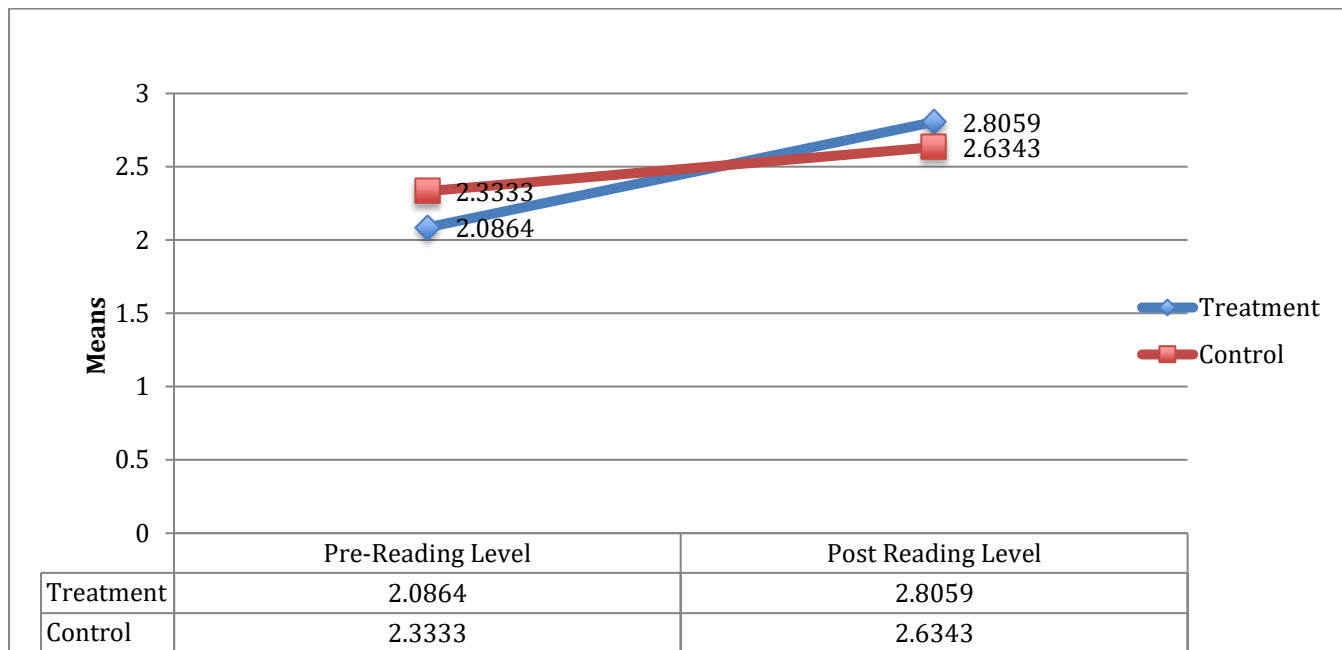


Figure 3. Group means – Proficient and Struggling Readers (Treatment and Control Groups)

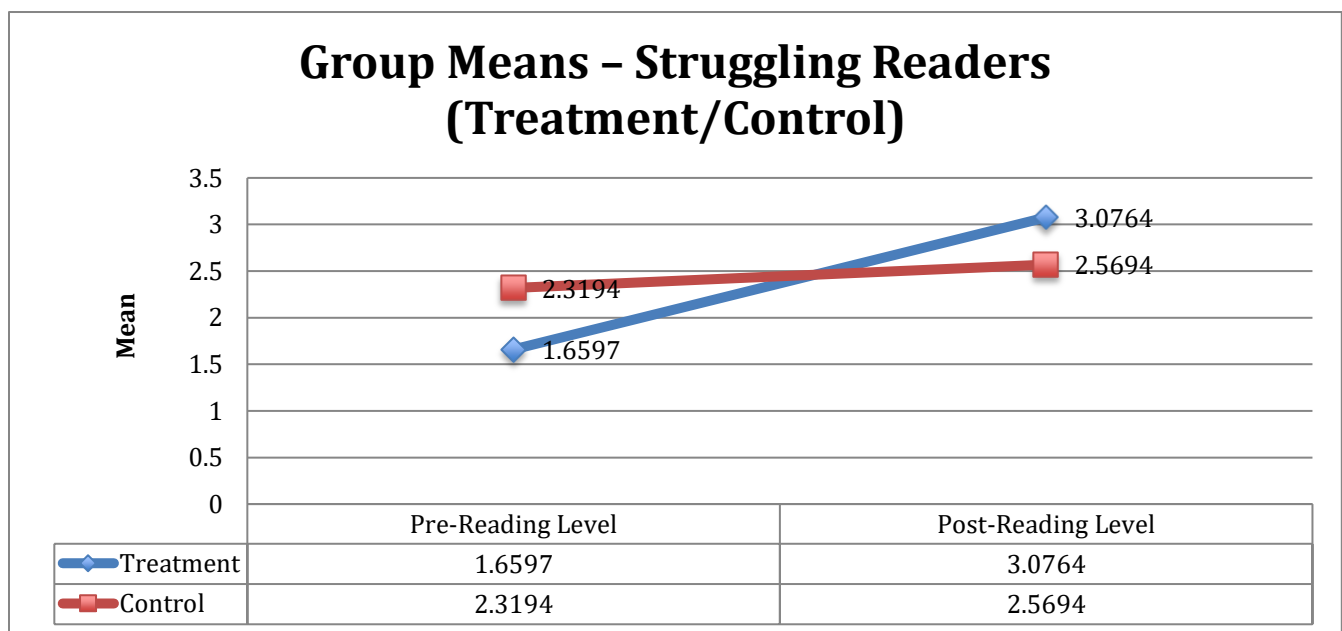


Figure 4. Group Means – Struggling Readers (Treatment/Control)

teachers and control group teachers conducted the final reading assessments using the SRA rubrics on all 59 students in the large sample. At the end of the sixth week post-interviews were finally conducted on the 24 students in the sub-samples of treatment and control students.

Data Analysis

A software package (Statistical Package for the Social Sciences - SPSS) was used for quantitative data analysis. Data from the baseline collection were first checked for any pre-group differences using a one-way ANOVA. Subsequently, a repeated measures MANOVA was used to determine treatment effects for the large sample. Because students were classified according to classroom pedagogy, it was important to next look at whether there was a between-subjects effect for both groups and types of treatment – literature circles or teacher-directed instruction. Finally, a second MANOVA was run on the subsample groups, to determine if there were differential effects of the treatment for struggling readers who are CLD and students who are proficient readers.

Qualitative data were analyzed using an emergent thematic coding process based on a case study approach in order to provide an in-depth analysis of the single experiences of students in treatment classes and explain how they were affected by a UDL-based literature circles' model in comparison to the single experiences of a control group that did not participate in the intervention. A graduate assistant blind to the purposes of the study and the groupings of the students also originally coded transcribed raw data to add a different perspective to the analysis process. Themes and results of the qualitative study were categorized and summarized pre and post based on target groups of the sub-sample of the study, which included professional readers and struggling readers in both treatment and control groups.

However, in order to ensure the accuracy or validity of the analysis, data were analyzed separately and then the results were merged and embedded during the analysis to see if there were trends and connections in the data. This point of interface refers to the stage at which the results from both components are combined or integrated (Morse & Niehaus, 2009). According to Mingers (2001), integrating the analysis in a coherent manner will

invariably lead to richer and more reliable results. The rationale for using a mixed design approach was to evaluate the widest range of possible effects of a UDL-based pedagogical model on a sub-sample using quantitative and qualitative measures. This approach helped to provide a thorough understanding of the research problem by providing a more comprehensive data analysis from multiple approaches and perspectives.

Results

Quantitative Findings

The results of the ANOVA tests that were computed to check for pre-test group differences in reading comprehension and higher-order thinking skills indicated that there was no significant difference between the overall control and treatment groups. However, in checking the subgroups, there was a significant pre-group difference for struggling readers ($F(1,10) = 12.787, p < .01, \eta = .561$). In a subsequent analysis, a repeated-measure MANOVA revealed that there was a significant difference in reading comprehension/higher order thinking between the treatment and control groups, but it was small ($F(1,57) = 8.264, p < .01, \eta = .127$). When the overall group (i.e. proficient and struggling readers) means were compared, pre and post, the results indicated that treatment group means increased from 2.09 to 2.81, while control group means increased from 2.33 to 2.63. The differences reversed in direction from pre to post-intervention results. That is, the control group actually began with higher levels of reading scores than the treatment group, but the treatment group achieved at a higher-level post intervention (see Figure 3).

Given that the overall groups were statistically significant, a follow-up MANOVA procedure to test for sub-group differences across treatment and control conditions among proficient readers and struggling readers was then computed. The results of the MANOVA were found not to be significant among the proficient readers (see Figure 4).

By contrast, post-intervention results indicated that treatment means for struggling readers were large, growing from 1.66 to 3.07, while struggling readers in the control group went from 2.32 to 2.57 (see Figure 4). This resulted in a significant difference and large effect size ($F(1, 10) = 18.696, p < .01, \eta = .652$).

Qualitative Findings

Proficient Readers-Treatment Groups.

Qualitative data suggested change had occurred for proficient readers in treatment groups in their engagement. Students indicated that learning in ELA was fun and more engaging. It was 'not as boring as last year; education, games, not taking notes 24/7, activities that keep me engaged' as one student indicated because they were more engaged in hands-on and authentic inquiry-based activities. After the study, students developed an improved feeling of student autonomy in reading/ELA. They also recognized that instruction in ELA was now differentiated, and thematically connected to science and social studies curricula through student-led literature circles and inquiry-based learning tasks. For instance, one student, commenting on the type of activities said:

Very good, fun activities, variety of activities, something new, variety of responses, the books are all connected in the unit with similar themes and topics.

As a result of the literature circles, double entry journals, individual performance tasks and inquiry-based projects, students indicated an increased opportunity for independence, student interaction, choice, ownership and responsibility for their learning. For instance, commenting on their feeling of academic and intellectual engagement in literature circles, one student said:

Yes, researching on diversity, finding different reasons why people come to Canada; some I haven't thought about; asking classmates and teachers "why", "when", and "what" questions during interviews was fun.

Another student also said, she was engaged more than half the time because:

I can relate and connect to what I am doing, e.g., literature circles about the world war.

To support this, another student shared similar sentiments and said:

I like the connections to text (text to self) during literature circles discussions.

Students also acknowledged that demonstration of their learning was more consistent with multiple intelligences and differentiated assessment. For instance, they made personal connections to texts in literature circles, created timelines, an art piece of an invention, made a poster, created a graph or wrote a poem or song, dance or mime, conducted an interview, or created a power-point slide show. They also enjoyed opportunities for student interaction and participation and the exposure to new genres, authors and ideas, several text options (multi-levelled texts), and the move toward higher-cognitive tasks and away from the rigid or structured learning paper-pencil tasks and the series that everyone was reading.

Proficient Readers-Control Groups. In comparison with proficient readers in the treatment groups, students in control group classes expressed similar themes pretreatment, but did not appear to increase in engagement post. In fact, most students felt that they were intellectually disengaged or not cognitively challenged in ELA because it was boring or uninteresting; they looked forward to their breaks; they lost focus too quickly; they needed to move around; some students had behavior problems and that teachers selected books that were boring. For instance, one student said:

We use worksheets in ELA, these are kind of boring.

Although this is a small number of students, the students' comments would suggest that they feel that giving students increased opportunities for autonomy and freedom of choice in what they study or how they express themselves is key to determining engagement and higher-order thinking skills.

Struggling Readers-Treatment Groups. Qualitative data suggested significantly different outcomes pre and post for struggling readers in the treatment group as compared to the control group. Baseline interviews indicated that classroom instruction was teacher centered and that it was mostly pencil and paper tasks (verbal-linguistic intelligence). For instance, one student said:

The teachers write the questions on paper and we write the answers down.

Another student said:

We tell what the book is about, we explain what the characters did and write paragraphs.

By contrast, after the study, students acknowledged that they were exposed to a variety of texts, genres, and authors, differentiated learning tasks and opportunities to demonstrate their knowledge in multiple modalities and learn collaboratively. One student said:

We talk a lot in groups instead of the teacher so we learn a lot by talking and sharing.

Perhaps as a result, risk-taking increased and students emerged as leaders who previously had not felt safe to do so. This also suggests that because students were given the responsibility for working with each other, learn in diverse ways and make decisions in accordance with their needs and interests, UDL-based literature circles provided a low-risk environment to help struggling readers feel empowered and engaged in their learning.

Struggling Readers – Control Groups. Unlike struggling readers in the treatment groups whose engagement showed change, results indicated similar outcomes pre and post for struggling readers in control groups. In both pre and post interviews, struggling readers in control classes indicated that school was fun only because of gym, field trips and having fun with their friends. They acknowledged that instruction and assessment opportunities provided were mostly verbal-linguistic (paper-pencil) tasks. One student said:

We use chapter questions, we discuss them in class, recap what happened in the last chapter, sometimes we write sentences about what happened in the book, sometimes we ask out teacher questions.

Although, some students felt academically motivated to read books that were series or had cliffhangers, most students noted that they were generally intellectually disengaged in their learning. For instance, one student said:

I don't have any reason to want the learning to continue.

Another student commented:

No, I don't want to keep learning, I like to get out for recess, I don't like to learn all day, I like to hang out with my friends.

These comments suggest that in order to reverse the trend of disengagement in classrooms, students must be given opportunities to have autonomy in the classroom through authentic hands-on activities.

Discussion

The research question initially inquired as to whether the implementation of a UDL-based literature circle instructional pedagogy would help to facilitate reading comprehension and authentic engagement in students. More specifically, would a UDL-based literature circle pedagogy improve reading comprehension scores, academic and intellectual engagement for students who are proficient readers and students who are culturally and linguistically diverse and struggling to acquire literacy skills? While quantitative results of this study showed that there was no significant difference in reading comprehension scores between the teacher-directed and student-directed literature circle groups, the qualitative data from literature discussion groups showed that the student-directed discussion group was more actively engaged than the students in the teacher directed discussion groups. By comparison, results of this study did show a significant impact of the UDL-based literature circles model on reading comprehension scores of treatment groups compared to control groups, and qualitative results also showed that treatment groups were more academically and intellectually engaged in their learning. The UDL-based literature circles created an opportunity for student metacognition that, according to Leal (1993), provides a catalyst for meaningful learning. During this study, struggling readers in treatment classes developed pride in knowing how their learning had changed. When one student who is a struggling reader described his ELA class and said, "We talk a lot in groups instead of the teacher, we learn a lot by talking; we learn how to read; I like talking about the books, I like to listen and to do a little bit of writing," and another does not feel boring in her ELA class because, "Students give different voices when they lead discussions," you

realize that you have created an authentic learning environment for learning, not only for proficient readers but for struggling readers as well. When students are involved and engaged in collaborative meaning making discussions, students are more likely to increase in their reading comprehension ability, critical thinking skills and their overall achievement.

The results of this study showed that struggling readers in treatment classes benefited the most from the treatment. During the study, the literature circles model allowed students who are CLD and are struggling learners to practice good reading strategies, allowing them to take risks in their learning. For instance, one student felt very confident in herself and said, "I feel prepared for literature circles because I want to make connections to the text and I want to share what I have read." Consequently, we can see that literature circles were in fact an effective reading strategy that enabled students who are CLD and are struggling readers to become reflective readers. In the qualitative data, the results were clear that student engagement, participation and motivation increased in the treatment classes. The authentic learning tasks allowed students to become cognitively invested in their learning because it was presented in ways that students were able to process multi-modally. Students worked individually, in groups and as partners on group projects, double entry journals and on individual inquiry tasks. One student shared how he demonstrated his understanding in ELA and said, "Through double entry journals, we make predictions about text, make connections to text and self, create timelines of events in a book, create an art piece of an invention, share my connections with others and ask questions." In addition to this, by working in these groups, the students were given more opportunity to interact with their peers and self-direct their own learning. One student said, "We talk a lot in groups instead of the teacher, so we learn a lot by talking." As stated by Casey (2008), students become more engaged when they are able to make choices and share accountability for their reading.

Long and Gove (2003) also found similar outcomes, although their study did not incorporate elements of UDL into the literature circles model. Their study showed that by combining literature circles and engagement strategies such as asking open-ended questions, making inferences, and analyzing critically evaluating texts, students

become more reflective, and push themselves to read, talk, question, feel, and think outside of the box, thus displaying higher-order thinking skills and the affective variables of intellectual engagement. These findings also corroborate with the findings of the study by Katz (2013) whose larger study assessed the same dependent variables using the Three-Block Model of UDL as an intervention tool for inclusive education. Findings from her study suggested that the intervention significantly increased students' engaged behavior, particularly active engagement, and promoted social engagement through increased peer interactions, student autonomy, and inclusivity.

Overall engaged behavior was significantly different between the treatment and control groups post intervention. Students in the treatment classes were significantly more engaged than students in control classes, with treatment group students' scores increasing overall and control group students' scores decreasing. This pattern of decreasing scores for control groups (i.e., students who have had no intervention) is commonly found in the literature. (Katz & Sugden, 2013, p.9-10)

Clearly, the treatment students interviewed in this study were feeling good about school, good about themselves, and empowered by feeling academically and intellectually engaged in their learning, which fits with results from the larger study by Katz, and perhaps corroborates these findings. After this study, the students in the treatment classes developed a positive attitude towards their learning because they believed that they were in control of their learning. They felt motivated by the material, used multiple strategies to ensure comprehension, and were able to make connections and construct new knowledge as a result of the interaction with the text, and draw on social interactions to mediate the literal processes involved in their learning. One student said that it was important for students to lead their learning because, "It helps students to self-pace their learning and find answers to questions by themselves." Consequently, when another student said, "It helped them to talk about what we know, make corrections to our learning, add on, share how we feel about books; it makes us better learners," we can see that students are taking responsibility and ownership of their learning.

Limitations and Recommendations

The research findings in this study should be

perceived in light of a number of strengths and limitations, which help to generate implications for future research. This was the first UDL- based literature circles unit these treatment teachers had tried and with only 2.5 days of training, all results have to be interpreted conservatively. Also, this study represents an initial exploratory study of the effects of a UDL-based literature circles instructional pedagogy on reading comprehension and higher-order thinking, and student engagement with a small sample. However, further in-depth and larger scale investigations need to be conducted to provide clearer insights into using this reading approach to improve and/or monitor the reading comprehension of both proficient readers and students who are CLD and struggling with reading.

The research design was a between-subjects analysis, which quickly became very complex due to the number of confounding variables. However, if the model is to be used as an instructional tool for all students, future research designs would need to use a longer period of time for the treatment, maintain homogeneity across all groups/subjects through randomization and matched pairs, in order to reduce unknown group differences and experimenter effects. Purposive sampling criteria based on the target schools' pre-existing classroom-based assessment and screening process was used in this study to select students to insure implementation and thereby truly assess outcomes of the model. This may have been different for each of the three schools. Although the analysis used in the study addressed this to some degree by employing ANOVA to analyze the posttest performance adjusted for pretest scores, it is possible that unknown group differences influenced the outcomes. Future research should use pretest information to stratify students based on reading, language, and cognitive abilities and randomly assign students to treatment. Also, a larger sample size and a smaller group difference between subjects that would increase the measure of practical significance of the results (effect size) may have produced clearer insights and increased accuracy as to whether participation in a UDL-based literature circles instructional pedagogy improved students' reading comprehension and engagement.

To meet the requirements of scientifically based research, a standardized reading measure (Standard Reading Assessment) was administered to all students in both treatment and control classes pre and post to determine the impact of the treatment.

Although this measure has been found to be reliable and valid, a second measure that also assesses the same variables in reading comprehension may have produced different results, or may have corroborated the results of the SRA. Using multiple measures to assess the same variables in order to enhance convergent evidence between instruments or concurrent evidence based on relations to external variables (e.g. other characteristics of the subjects) is a possible recommendation for future studies. Also, the use of test experts or other classroom teachers to examine the internal structure of the measures (content validity) and how the items supported the variables in the study is also a possible recommendation for further studies. Finally, novelty effects (or newness) of the treatment may also have posed as a threat to the external validity of the study. For instance, it is difficult to determine if the new method of teaching/intervention may have caused the students to pay more attention and consequently demonstrated improvement in their reading comprehension and engagement. Perhaps, the students were using pre-taught strategies in reading comprehension in the literature circles.

Conclusion

Quantitative results of this study showed small but significant gains in the reading comprehension and higher-order thinking skills for proficient readers in treatment classes. Perhaps more importantly, results indicated that students in treatment classes who are CLD and are struggling readers made significant gains in reading comprehension and higher-order thinking skills, closing the gap toward reading proficiency. By comparison, results of this study did show a significant impact of the UDL-based literature circles model on reading comprehension scores of treatment groups compared to control groups, while qualitative results also showed that treatment groups were more academically and intellectually engaged in their learning. Specifically, based on the results of the qualitative study, proficient and struggling readers in treatment classes felt very positive about the impact of the change in pedagogy on their learning as compared to their counterparts in control classes, which resulted in an increase in engagement, motivation, and participation in their learning. Treatment group students demonstrated a high sense of self-efficacy about their learning and were able to

demonstrate their learning in ways that were consistent with their learning styles and the diversity of their classrooms. It was obvious from the qualitative results that students in the treatment classes were passionate about the authentic learning tasks and the connections they made to texts during literature circles, and were more actively engaged than students in the teacher-directed discussion groups.

If the claim by Parker, Quigley, and Riley (1999) that students who are struggling learners benefited the most from literature circles is true, then based on the evidence presented in this study, it is clear that a UDL-based literature circle instructional pedagogy is a valid method of instruction for students who are CLD and are struggling readers. These research findings demonstrate that a UDL-based literature circle pedagogy does have promise, and could, with research and development, prove to be an effective way to improve reading comprehension. If further studies prove a UDL-based literature circle pedagogical model to be a successful approach to reading instruction, they may also be a viable alternative for meeting the needs of students who are CLD and are struggling with reading. Literature circles have great potential, but more empirical research studies on this popular instructional approach is clearly needed. This study may be a springboard for further studies regarding combining the principles of UDL and literature circles to support reading comprehension instruction for all students.

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-Appendix A-*Sample Standard Reading Assessment***Exploring Extreme Environments (6)**

On the next two pages, you will be reading about exploring space. What do you already know about it? Using a web, words, chart, or pictures, show what you predict some of the information might be.

Space Exploration

Explorers are people who go to places very few people have been before. For thousands of years people have wondered what it was like in space. Some ancient the Earth was actually inside a glass ball. They believed could go up high enough you could touch the glass.



people thought
that if you
Other cultures

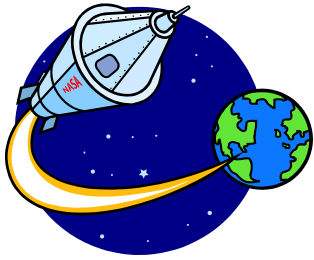
Star Gazing

have thought that space was inhabited by gods and angels. Today we no longer wonder. We are not limited to merely guessing or imagining. Now we can actually leave the Earth and see for ourselves.

The History of Space Exploration

In the beginning, space exploration started from earth. People studied the movements of the stars and planets from here, because they didn't have rockets to take them into space. During the centuries when space travel was only a fantasy, scientists tried to figure out what the environment in space was like. Greek philosophers discovered that the earth is a sphere. Then astronomers learned that the earth moved around the sun. Hipparchus, another Greek, prepared information about stars and the motions of the moon.

Rockets Away!



Rockets were invented long ago. Ancient rockets used gunpowder like fireworks do today. In China a long time ago people defended themselves in a war using rockets. In Europe too, armies used rockets to fight. In 1804 the British army even had a rocket corps! In the U.S., scientists began experimenting with rocketry in the early 1920s. They launched the first rocket on March 16, 1926. At the same time, studies on spaceships and rockets were being conducted in several parts of the world.

When World War II started, armies tried to develop rockets that could be fired at counties far away. The most successful were the Germans. They developed the V-2, a rocket used in the bombing of London. Now long-range rockets are used to explore space!

Humans In Space.

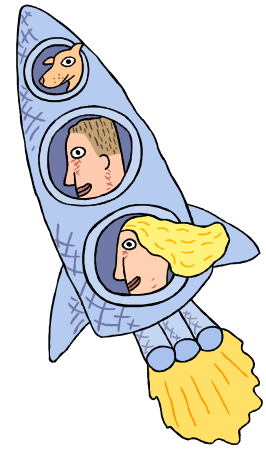
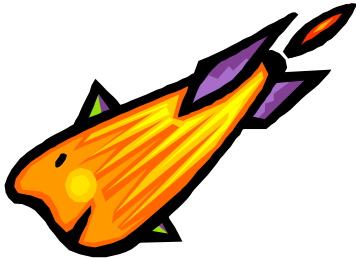
Space is a dangerous place for humans in a number of ways. It doesn't have air or oxygen, so human beings can't breathe. The pressure in space can destroy a human body in a few seconds. Your body will literally explode! Temperatures in space close to a planet are freezing cold. On the other hand, temperatures can become deathly hot close to the sun's rays. When humans travel into space, they are protected against the space environment. They are inside a sealed cabin or space suit. They have a supply of air or oxygen. Air conditioning controls the temperature and humidity inside the cabin or space suit. All these things also affect the spacecraft. When scientists design and build them they have to consider the space environment. They put material to absorb and reflect heat. That way the spacecraft doesn't burn up. In the future, long trips between planets may mean that spacecraft need heavy shielding.



are protected
suit. They
temperature
the spacecraft.
environment.

Today only astronauts go into Space. A space trip is very expensive. However, scientists are developing new space crafts. These spacecraft will make it cheaper to fly a space mission.

Eventually, everyone may be able to take a vacation in space. Some people worry that we will pollute space if everyone travels there. What do you think?



Criteria:

On the paper below, show what you understood from your reading (you can use extra pages, too). Using a web, words, pictures, and /or charts, your response should:

1. Show or describe the main ideas in the passage, accurately and completely.
2. Give some supporting details.
3. Organize notes and ideas into categories related to the main ideas (this means use title or headings, and organize the information)
4. Show or describe the images in your mind as you read.
5. Interpret the text and graphic features (pictures, charts, etc.) – what does this text really teach you?

Space Exploration Miscue

The History of Space Exploration

In the beginning, space exploration started from earth. People studied the movements of the stars and planets from here, because they didn't have rockets to take them into space. During the centuries when space travel was only a fantasy, scientists tried to figure out what the environment in space was like. Greek philosophers discovered that the earth is a sphere. Then astronomers learned that the earth moved around the sun. Hipparchus, another Greek, prepared information about stars and the motions of the moon.

Strategies used:

_____ Re-reads . self-corrects for meaning

_____ Uses word structure

_____ Uses graphic clues

_____ Uses context clues

_____ Uses prior knowledge

Fluency:

_____ Halting _____ Word for word _____ Fluent _____ Expressive

Space Exploration Conference Record

1. Find the part of the passage that talks about rocket propulsion. What do you think a “corps” is?

_____ skim/scan _____ uses text features (headings)

2. Why do you think some people are worried about pollution in space? (infers)

3. What is something new you learned that you didn’t know before? How does it connect to what you already knew? (connections)

4. What were some of the questions in your mind as you read this? (questions)

5. Do you think people should take trips into space? Why or why not? (Opinions)

Early 6

Readability – 6.3

F&P Level – U

Student name: _____ Class: _____

READINFO: Performance Standards in Reading for Information, Grade 6

Student is...	Beginning to develop (K-)	Approaching expectations (C)	Fully meeting expectations (B)	Exceeding expectations (A)
SELF-MONITORING Monitoring • Self-correcting • Word solving • Locating detail Setting a goal... • before reading • after reading	• Often focuses strongly on decoding and does not check for understanding; needs help to select and use appropriate comprehension strategies • Tends to sound out new words; may give up easily • Needs assistance to use text features (e.g., headings, diagrams) • Guesses or tries to recall details instead of rereading text to find details needed for question or activity • Requires support to set appropriate goals for language use • Formulates questions for inquiry with a template	• Checks understanding and adjusts comprehension strategies if prompted • Uses sounding out, context clues, and dictionaries; may not notice word parts in technical or specialized language features • May need prompting to use text features • Can locate some information needed for a question or activity; often incomplete	• Checks for understanding; adjusts comprehension strategies to deal with specific problems or features of the material • Uses context clues, word structure, graphic clues, glossaries, and dictionaries to figure out unfamiliar words; may have some difficulty with technical or specialized language • Uses text features effectively to preview and locate information • Rereads and skims to find relevant, specific details to complete questions or activities	• Evaluates own understanding; makes deliberate and effective choices about how to approach challenging material • Independently uses context clues, word structure, graphic clues, glossaries, and dictionaries to figure out technical and specialized vocabulary • Uses text features effectively to preview, locate, and organize information • Quickly and efficiently finds specific details to complete questions or activities
	COMPREHENDING Using prior knowledge Making connections	• Has difficulty predicting content; may offer illogical guesses • Makes connections between prior knowledge and a variety of texts when prompted • May have difficulty seeing how new information connects to prior knowledge; prior knowledge may be limited	• Makes simple logical predictions about content based on prior knowledge and text features; may be able to predict structure • Seeks connections between prior knowledge and a variety of texts • Makes some simple, obvious connections between new information and prior knowledge	• Anticipates content and structure by drawing on prior knowledge and text features • Seeks connections between previous experiences, prior knowledge, and a variety of texts and ideas/concepts • Compares new information and ideas and prior knowledge and beliefs about the topic; may show insight through analysis or explanation

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