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**The Rafer Thorne Project: Investigating the Cooperative Learning Project Experience.**

**Abstract.**

This article begins with an introduction that describes the *Rafer Thorne* cooperative learning project, where high school and college students work in a collaborative endeavor to write, illustrate and finally publish a young adult fantasy novel. It also asks the questions, (1) What is a cooperative learning project in both the literature and practice? (2) How are the student affected? (3) What can be learned from this research to inform future projects?

The literature review begins by using the current literature to define a cooperative learning project. It also examines case studies of previous projects, and articles that might inform working practice. The method of research used in this study was unstructured interviews, which were later analyzed for common themes. The participants interviewed were five students, two parents and one educator. Although one of the parents was also a teacher and she was interviewed in both her roles, as an educator and parent. Another was interviewed twice as a parent and professional volunteer, so there were 10 interviews altogether. The results section describes in detail common themes that were found in the interviews. These were (1) Fun, (2) Conflict resolution, (3) Physical Environment, (4) Accomplishment, (5) Social emotional environment, and (6) Planning and time management. Two students were outliers bringing up themes no-one else did (1) Plans for future projects, and (2) Manga, style of Japanese, comic art. Important quotations from the participant are provided to illustrate the themes.

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The Discussion/Conclusion section provides useful information gleaned from the participants. This body of information is applied to practical solutions and tools to inform future projects, such as templates for projects, the use of Drop Box (a way of quickly sharing large files over the internet), communication guidelines for collaborative communication, and answers to research questions. It is a record that can be used for a working model, illustrating what a cooperative learning project looks like. The overall experience of doing this research project is described, its drawbacks (conflicts over character development, problems with time management) and its benefits (learning to collaborate with peers in the creative process, practical life and career skills that are learned, and a sense of achievement in the students). In conclusion there is a discussion of how this project fits into the overall scheme of similar research, showing the gap in quantitative research and in cooperative learning projects in general that there is in the United States, especially at the secondary level.

**Introduction and Research Questions.**

From September 2013 to June 2015, home-schooled children, ages eight to seventeen, and two college students were involved in a cooperative learning project, and published the *Rafer Thorne* graphic, fantasy novel. Parents and professionals also volunteered their time. Six families were involved in various ways. The participants were residents of Oregon and Washington. Some volunteered expert advice, some wrote fan fiction that was later incorporated as backstory, and others did the editing. Others were involved in test marketing and social media. A smaller group of six students, two educators, two parents and several community volunteers were directly involved in developing the plot, writing the main story line, and in creating the art.

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Another project similar to the previous novel is being planned, in which the manuscript for the second book in the series will be written.  The students will also participate in writing and illustrating the book, but this time the project will be expanded to include transmedia projects that tie into the novel. These transmedia projects will include film-making, game design, fantasy world building on Wikia and other websites, and the development of an electronic e-book. Some of the same students will be involved in the second novel, but several new students will be joining the group project. These will be residents of Ashland, Oregon and students at Southern Oregon University. In order to better design our new project, this research will center on gathering information that will help the participants better plan and implement this joint endeavor. To do this, the research will be looking to answer the following questions:

(1) What does the new educational practice of cooperative project based learning look like?  
(2) How are focal students who participate in cooperative projects with peers and professionals affected in forming their identities and career goals as well as the acquiring of professional skills,

both practical and interpersonal?  
(3) For these students, families and professionals who work together on the project, what are the engaging and appealing aspects of working on a cooperative learning project, as well as the pitfalls that might inform instructional and working practice?

**Literature review**

***Definition of Terms: What is Cooperative Project based learning?*** For the purpose of this research paper, the definition of “Cooperative Project-based Learning” will be how it is defined in Helene Harte’s journal article “The Project Approach. A Strategy for Inclusive

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Classrooms*.*” It is a style of education that encourages peer collaboration on a specific project or goal, with community and family participation, and the teacher as a co-learner (16). The term “Cooperative Project-based Learning” is not universally found in all the literature. There are various definitions and terms used for this teaching method and educational philosophy. For example, in the Chinese literature it is usually referred to as “collaborative learning” (Chen 354; Chuang 226; Liu 37). In Italy, most of Europe and in American early childhood literature it is referred to as the “Reggio Approach” (Calgory; Goffin 1; Kim 44). It is also often referred to as the Doweyan Philosophy of Learning (Lau). There are many other terms used as well, but all have the same two elements in common: 1) The idea of students learning in cooperative groups consisting of peers, teachers, family and the community. 2) These groups work together toward a project that applies the knowledge and skills the students have learned. So the term “Cooperative Project-based Learning” is useful as a universally understood description of the concept.

***Quantitative Studies and Qualitative Case Studies of Current Projects, Schools and Programs***. These qualitative case studies are useful as windows into classrooms that apply the

cooperative project-based approach, so that the teacher is provided with a detailed description of how it is actually being done in various environments. However, these case studies, for the most part, do not provide specific plans for implementation or the educational philosophy behind the practice. Their main purpose is as a record of what is being practiced currently. Sometimes a qualitative or quantitative measurement of the effectiveness of the method is also part of the study, but not always. These case studies can be very useful as examples.

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***Italy-Reggio Emilia****.*  In 2008, CNN news televised an Impact Report on Reggio schools both in Italy and the U.S. In this short documentary the cooperative project-based approach is seen in action. Children age’s three to six at the Laguzzi International Care Center in Reggio Emilia, Italy, are building an amusement park for birds, complete with a Ferris wheel, a pond and a wind machine. Inside they have constructed a model city out of shoe boxes that takes up half the classroom. Other children are creating projects from their own imagination. Many are working together on long-term group projects, combining all of their various skills. The teacher walks around the room stopping to talk with various children as she takes notes and documents what the children say and learn. She helps them solve problems and verbalize their goals. Parents, grandparents and members of the community are a part of the classroom (Impact).Videos of other Reggio Schools are numerous and a valuable resource for any teacher wishing to put this program into action. There are over thirty available on-line at the Reggio Emilia Approach YouTube channel. The best of these is the *ABC Play Center*.

One Reggio Emilia case study that is important to look at as an example, is the Kilpper Light House project, because of the impact it had on the community. A case study and

photographic documentation can be found on the school’s blog. This project was done in a small coastal town, where Reggio students designed a working lighthouse for the community. The high-school aged students integrated numerous skills to do this, including mathematics, science, engineering, and construction skills. This lighthouse was a much-needed resource for the community, a fishing village that occasionally lost small fishing vessels on the rocks near their shore (Kilpper). Pictures of the lighthouse project can be seen at the following website: http://www.kilpper-projects.net/blog/?p=129.

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Another useful descriptive article is “Shades of Pink” by Bo-Sun Kim. She describes how a project is developed around the children’s fascination with a Monet masterpiece of a flower garden. This article is useful in that it describes how various creative endeavors, from gardening and writing to art and music, can all be created around a common theme and integrated into a collaborative project (44-50). ***Center for Educational Research and Innovation***. An international organization that is doing by far the most in-depth research on project-based cooperative learning is called the Center for Educational Research and Innovation. This is the translation of its name from French, since its base is in Paris, France. The anachronism for the French is OECD. This organization has done literally hundreds of case studies from all around the world. They have compiled these studies in to a 230 page report called Innovative Learning Environments. The goal of this organization is to support groundbreaking research and experiments in innovative education, by publishing research, and providing a worldwide venue for cutting edge educators to meet and collaborate on ideas. They do this by holding international conferences in various locations around the world. This body of information is invaluable in that it provides working models to follow in developing similar projects and learning environments. There qualitative case studies followed by thematic analysis are good models for educational research of this type (OECD 5-20).

The Beatenberg Institute in Bern, Switzerland was one of the schools studied by OECD. The case study describing the school shows its practices, its planning and how it assesses learning. The article describes the schools philosophy that learning as a social process, and describes the practice of what they call “connected learning,” by creating a cooperative learning environment. This case study is also valuable in that the school is both a primary and secondary

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school so that a model is provided for secondary and higher education. (Ramsier 4-45).

The Center for Studies in Design at Monterey in Nuevo Leon, Mexico (CSDM). This case study provides a model for the constructivist approach in higher education. CSDM’s main focus is the construction of knowledge through the development of real projects done by the students. These projects, in engineering and design must provide one or more solutions to real problems of the community (Arizamendi 6-9, 11).

Another OECD study was done at Europaschule Linz in Innsbruck Austria, where the concept of “learning by teaching” is introduced in a heterogeneous learning environment where students in grades five through eight learn together in the same classroom and are responsible for each other’s success. There are no individual grades, the motivation for learning is the success of the whole group. The article provides important methodologies for creating this type of cooperative classroom atmosphere, and shows the valuable learning that is created when the student is also responsible for teaching the subject (Schrittesser et. al 2-13).

Makor Chaim Yeshiva High School in Kibbuts Kfar Etzion, Israel, moto is that they promote the skills necessary for the “citizens of tomorrow,” one of which is the ability to work in cooperative “think tanks” to solve problems. By studying complex texts in small groups, the students are challenged to develop their analytical abilities by interacting with each other and collaborating in order in order to decipher the meaning (Tubin 5-20).

Lok Sin Tong Leong Wong Wai Fong Memorial School in Hong Kong, China’s goal was to provide an atmosphere of comradery among students in an impoverished area of Hong Kong. There were refugees from various nations. The moto of the school was “happy home away from home.” The article describes how the teachers and school principal create an atmosphere of

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learning that is also a family cooperative environment. Parents and community members participate in the education of the children in group projects and social activities; even the principle is part of the family group. This school is an important model in that it was very successful in increasing the educational level of the students and their self-esteem, as well as their feelings about school. When interviewed 85% of the students said that they “loved the school.” (Chun et. al).

***The Chinese Literature***. There is a vast amount of literature on cooperative project-based learning published through Chinese institutions of higher education. Unlike other studies, most of them are quantitative in their approach, measuring methods of teaching with statistical data, charts and formulas. The Chinese have applied the cooperative project-based learning approach to teaching in almost every subject area including math, science, reading, and in primary, secondary and early childhood education. The amount of information provided in these studies is vast. What I find interesting, however, is that in these studies there is also a good deal of weight put on emotional and social concerns, student motivation and the development of friendship between the students, teachers and parents. This is often also measured statistically and is given just as much weight in the studies as the achievement of a particular educational objective (Chen et. al 356-366; Chuang et. al 226-239; Kim et. al 44-50; Lau; et. al Law et. al 402-425). ***Africa*.** An article published through Munyaradzi Makoni World University describes how cooperative project-based learning is being used in higher education in eight African Universities in Zimbabwe, and Rwanda. The university students are using the skills that they are studying in engineering, water treatment, disease control, and energy, and applying it to projects that are helpful to their communities. The article also follows the students after graduation,

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tracking their community involvement, employment and whether or not they continue to work as a social network after graduation. According to the study of 444 alumni, 400 remained friends after graduation and 268 were working in their perspective fields in their communities, and 36

went on to higher education (Munyaraduzi).

***The Canadian literature.***  Another valuable resource for applying the cooperative project approach is in the Canadian Literature. This is because the school system in Canada is very similar to that of the United States and the methods described could be easily applied to classrooms in most school districts in the United States. Many of the Canadian School Districts are now applying the collaborative approach even at the upper grade level. It is important to have examples of successful cooperative projects in a cultural and educational environment similar to what we would find in the US (Calgary,Ontario, Jacobsen et al, 14-18).

An excellent article called “Strategies for Engagement” was published by the Canadian Education Association, a branch of the Canadian Public School system. What was tremendously useful about this article is that it lays out strategies for high school age students. It carefully documents three cooperative learning projects in several schools in the Calgary School District and gives specific strategies for implementation. The first was an archaeological dig. The second was a construction project that included robotics and the third a gardening project. History, Science (biology, robotics engineering and botany), data collection, mathematics and computer design were all used to do these projects. But what is especially helpful is that this article shows that educational bench marks were met effectively with this approach to teaching (Jacobsen et. al, 14-18).

What all of these international studies have in common was that they provided models

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and clear examples of successful collaborative projects that were done in various cultures, with a variety of age groups, with different methods and in different learning environments. Examples can be found in all of these studies that could be applied usefully in practice. ***The United States****.* Although there are many preschools and nonpublic kindergartens based on the cooperative project-based model, there are almost no public schools that have adopted the concept as a whole and the literature is scarce at the primary and secondary school level. There have been some projects and research done, but on a limited basis. Most of these projects have to do with a particular short-term goal, but it’s not the overall teaching method adopted.

One such project was the Living Book Project in which the Long Island School District did a project surrounding the book *The Immortal Life of Henrietta Lacks.* High school students wrote plays, created comics, did research projects and works of art, all based on the book. The project was considered a big success by the school district, but didn’t represent an overall change to the school system’s method of teaching. Unfortunately, this article was lacking any useful information about their processes and how they designed the collaborative environment. It mostly focused on the end product that was produced and the fact that students of various ethnic and racial backgrounds collaborated together, but it did not tell how this was accomplished (Kelso 56-63).

Christopher Sweeney organized a cooperative project integrating art, design, engineering and marketing with his synthetic tennis shoe project. The students designed marketable tennis shoes that were manufactured and sold in shoe stores. Christopher Sweeney says, “This was a genuine experience that will last a lifetime.” But again, this was a one-time project (Sweeney 30-

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31). ***Applications to Various Subject Areas****.* A useful article by Tori Flint, “Making Meaning Together: Buddy Reading in a First Grade Classroom,” explains how she uses participatory strategies in teaching emergent readers, by students reading out loud to each other in a social group and helping each other decode the meaning of individual words and the story’s content. The students overall comprehension of what was read and the retention of it was increased. When the students were surveyed about how they felt about reading, 17 out of 20 replied, “It was

fun.” Flint considers this an even greater breakthrough than increased reading skills (296).

An important article on strategies for teaching mathematics in a cooperative project-based model is “Mathematics in Early Childhood: Research-Based Rationale and Practical Strategies.” This article is loaded with ideas on how to integrate mathematics into group projects. The particular project it lays out in detail is creating a community vegetable market. The children learn to manage a vegetable market, handle money, count the inventory, determine pricing and apply their math skills to a true life situation (Linder 30-36). In the article “Shedding Light on Engineering Design” cooperative projects in engineering are described in a sixth grade classroom (Capabianco et. al 58-64). A growing subject area, where cooperative learning is being used, is in computer-supported collaborative learning (Raths 39-42: Mostmans et. al 104-113). Case studies of cooperative projects for the upper grades in the United States are scarce, however I found one that was very useful. The article “Increasing Secondary Teachers’ Capacity to Integrate the Arts,” describes the details of how a science teacher and a teacher of the visual arts collaborated in a project to design a science book illustrated with enhanced digital photography by the students. The book, *Stories About Ecosystems*, was a great success and a

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fantastic idea for integrating science and art. An entire section of the article was about an interplay of interlocutors – between the students working in the two disciplines, the co-teachers, their interactions with one another and how they accomplished the project in a collaborative effort. The results of the study showed that the project was not an overall success when it came to making an impact on teaching methods as a whole. The projects themselves were a great success. The students involved more than reached their educational benchmarks, and in many cases went way beyond them. In working together on creative projects, learning was enhanced, not only in the creative arts, but in the non-arts curriculum as well. However, in the third year of the study, teachers did not continue using the techniques they had learned. When interviewed, the overall consensus as to the reasons why were the following: They did not have enough time that it took too much effort, and the structure of the current system didn’t allow them the freedom. Many teachers also showed a reluctance toward working together. They describe a culture in the public school system of the United States in which the classroom is a little kingdom, with the teacher as the monarch, the walls of the room the borders, and all outsiders the marauding hordes. One element of the project that did continue in practice beyond the training, was that the teachers of basic core classes were much more likely to use the arts in their teaching (Richard 224).

This is where there is a gap in the literature. There were very few case studies that could be applied to our current educational system in the United States that gave hands-on practical methods for making cooperative project-based learning work. This is also where this study his investigating the Rafer Thorne Cooperative Learning Project can do a small job in filling this gap by providing a description of a working model with practical methods for teaching.

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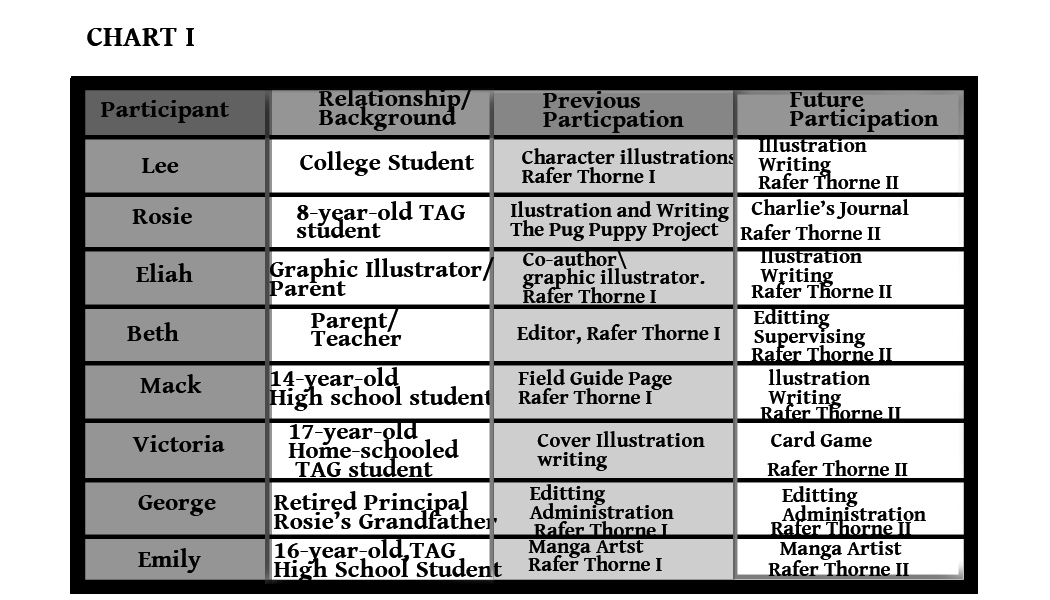
cooperative learning environments with upper grade students. Gathering information and describing the working practice can be a valuable tool as a model to be used for future projects. Investigating the process and methods through interviews of the participants is the method used to gather this information

**Study Design and Methods. *Data Collection.***  The type of interview process used for collecting data was a series of un-structured interviews using nonstandardized open ended questions. This was in order to achieve in-depth information that could be compiled into a case study format and to give the interviewer the flexibility to be creative in the kinds of questions being asked. The interview format suggested in the Smith and Osborn article, *Interpretive Phenmenological Analysis*, was used in which the researcher constructed questions that encouraged the participant to speak about the subject with “gentle nudges” rather than using leading questions looking for specific predetermined answers. A series of prompts was written that could be used if needed, in case the initial question was too vague or not in-depth enough to elicit a response (61). Four sets of interview questions were used (see appendix 2.). One set that was geared toward student participants, one for the parents, and another for educators and a fourth for professional volunteers. The participants were interviewed in their own home, either in person, through Skype, or over the telephone. Permission was granted from all participants to record the interview, with an audio device. Each participant was also asked permission to be recorded at the beginning of the interview. IRB approval from Southern Oregon University was also received for the research.

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***Subject Selection.***  The subjects that were selected were any-one who wanted to participate, who had experience in cooperative project based learning that had input to give and the time to give it. The following participants gave their input in an open ended interview: two Parents, Eliah and Beth: two educators, Beth and George: Five students, Mack, Emily, Victoria, Rosie, and Lee. They were all selected because they had already worked with me on previous cooperative publishing projects, either in a homeschool environment or in an enrichment program for the talented and gifted. They were also selected because they are all planning to participate in the next publishing project. Four of the students worked on our previous project, the first *Rafer Thorne* novel, while Rosie the youngest student worked on another publishing project called, “The Pug Puppy,” with her brother Nate. Nate was not interviewed, because he didn’t want to do it. The parents, professionals and educators all had volunteered their expertise and help on the *Rafer Thorne* project, and were planning to help with the next project as well. George is a retired principal as well as Rosie’s Grandfather. Although one of the parents (Beth) was also a teacher and she was interviewed in both her roles, as an educator and parent. Beth is Rosie’s mother. Both Beth and George have had experience using cooperative projects in their teaching and administrative roles. Eliah was a parent, but was closely involved with the project from the beginning and was the co-author of the back stories for the novel, and graphic designer for the book. She is a corporate graphic illustrator. Eliah is also Mack, Victoria and Emily’s mom.

Lee is a student at Southern Oregon University. Since Beth and Eliah were interviewed twice, in both their roles, there were ten interviews altogether. The following chart is an

overview of the participants’ background and participation: 

***Interviews:*** The interviews were over were skype, recorded and transcribed on a smart phone, and in face to face interviews using Dragon Naturally Speaking to record and transcribe the conversations. The interviews were planned for half an hour, but they were allowed to go longer if they wanted to keep talking. In the case of Emily, her answers were typed as she gave them. Emily is not able to sit still for long periods of time (over ten minutes), and needed to be able to get up and run around the room freely. Some of her answers were given as she was running up the stairs to her room to get something to show me to demonstrate an idea. However, she has an excellent memory for verbal communication, and even though she did get up frequently, she also read along, standing over the interviewer’s shoulder, as she typed Emily’s answers and helped transcribe her words.

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exactly as she said them. In the case of Rosie, the researcher interviewed her for twenty minutes over Skype, and then called back to interview her with a few follow up questions. Everyone was interviewed in their own homes.

After reading through the interviews several times to get a general overview, and making notes in the margins, the notes were made into a list of common themes, including the two outliers, Mack and Emily. The list was then narrowed down to eight themes, a color was assigned to each theme and the transcripts were underlined with markers corresponding to each theme color. A chart showing the themes was made and the frequency that they were mentioned. The same themes were also looked in the literature.

This method known as Interpretive phenomenological Analysis (IPA) was what was used to interpret and code the data. IPA is used in qualitative research to find emergent themes, by looking for relationships between ideas and clustering them (Smith and Osborn 64-66). For example, in this study, concepts surrounding the idea of enjoyment, relaxation, celebrations of achievement and fun are all grouped together under the theme of, “fun.”

**Results.**

***Common themes in found in interviews.***  The data was narrowed into themes surrounding six general categories. These were (1) Fun, (2) Conflict resolution, (3) Physical Environment (4) Accomplishment, (5) Social emotional environment, and (6) Planning and time management.

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Mack and Emily were both outliers in that they brought up subjects no one else did. These were (1) Plans for future projects, and (2) Manga.

Determining which category certain statements fell into was at times an ambiguous task. For example, conflict resolution and the social and emotional environment, sometimes merged into one subject. How it was separated was by making a differentiation between the discussions of specific conflict resolutions and the discussions of the overall social/emotional environment

and how it was developed. Social learning was included in the social emotional category, although it was often mixed with comments about a sense of accomplishment, the

accomplishment being the creation of a cohesive group and a spirit of comradery. Specific plans for organizing workspace, scheduling and ideas for structured creative endeavors were put in the planning and time management category, even though they were often mixed in with comments regarding conflict resolution as a means to prevent future conflicts. Below is a chart showing the common themes, who brought them up, and how many times they were mentioned.

The following is an overview of the interviews and the data I gleaned from them, divided up into their eight subject areas. ***Fun****.* The excitement and sheer fun of creating an imaginary world together showed the strongest emotional energy. As a whole, participants were passionate when talking about their imaginary creations. This passion came not only from the students, but from parents and volunteers as well. Each participant and volunteer talked excitedly about the part of the project they helped create and the fun that they had in doing it. A universal theme in all the interviews was that creating an imaginary world and characters was fun.

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Rossie, an eight-year-old, talked about playing the story of her pug puppy book with her friends, after sharing it at school for show and tell. She said with extreme enthusiasm, jumping up and down waving her arms, “Guess what! We play pug puppies on the playground! I’m the owner and all my friends are the puppies! It’s so fun! Sometimes we play that Cruella captures them and me and Nate rescue them. Nate is always Superman.”

Beth, a teacher and parent volunteer used the word “fun” three times in her interview, “enjoyed,” five times, and “exciting” three times, even though she had what would be considered the dullest job on the project, editing.

This sense of fun was even talked about as something that needed to be planned for and protected. Lee, a college student, was concerned that we worked too hard toward the end, when we had a print deadline and lost the fun. Lee commented, “At the end it got too serious. I think we could’ve done more things together, off the job, to relax and have fun and not have our nose to the grindstone all the time. Then we would have had more creative juices flowing, if we were

to relax more. Things got a little compulsive and grim those last few weeks. When everything is about work, it’s like the old saying “all work and no play makes Jack a dull boy.”

Emily, a fifteen-year-old, expressed concern about her mom (Eliah) spending too much time sitting in front of the computer and that she needed to take more breaks and have more fun. She was also referring to the last five weeks of crunch time.

Victoria, a seventeen year-old student, said, “We should have all had a big celebration, a pizza party or something when we got it done, made a big deal out of it.”

***Conflict Resolution.*** The next topic that was brought up frequently had to do with conflicts. Most conflicts centered around the imaginary world people were creating together.

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Suggestions for managing conflicts were given by everyone, except for Mack who said he had no conflicts. However, he did suggest a work schedule would help with “comradery,” which could have been a reference to conflict over having to wait for each other to finish work. Suggestions for specific plans for avoiding conflicts will be covered later under the topic of, planning and time management.

Emily talked about the conflicts she had with the Eliah over Kiyah the Elf Princess, a character in the book. She admitted that she had drawn the character “off model” and had to throw away a whole panel that she was working on and start over. However, she also said that they worked it out in the end everything turned out fine. She realized the importance of staying true to the original character. There was also a conflict between two of the artists on how to draw Rhahmahduu, the Gnome. Victoria thought he should be plump and cute and Eliah thought he should look like a warrior. Similar conflicts were mentioned over the illustration of the Dragon Queen. With this character it was a misunderstanding. The queen was supposed to look like a snake and therefore had no nose, just a flat face with nostrils. Victoria, who was creating the 3D image of the queen for the back of the book, didn’t understand this and gave her a human nose. “Victoria commented, “It took me forever to understand what she meant by “a flat nose,” that the Dragon Queen was supposed to have no nose at all.”

Rosie after almost a year was still angry that Nate drew the pug puppy “wrong.” At the same time she was positive about the resolution. Her section of the interview on the subject shows the same pattern as the other conflicts discussed. There was a conflict, but it was resolved, with help from a parent or teacher. The following section of Rosie’s interview shows this pattern.

Interviewer: How did you and Nate work together?

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Rosie: He wouldn’t listen. I told him he was drawing it wrong and he got mad and scribbled on my picture. His pug puppy looked like a pig. He made a pig nose. He said mine looked like a goblin.

Interviewer: So what happened?

Rosie: You made us take a break. Then when we weren’t mad anymore, we talked about it.

Interviewer: What did you talk about?

(She shrugged her shoulders.)

Rosie: You said that I could draw my pug the way I wanted and he could draw his pug the way he wanted. So we had two different kinds of pugs in the book. I didn’t like that, because there was only one pug in the story.

Interviewer: Did that ruin it for you?

Rosie: No, I just didn’t like that one part. The pig nose. I like Nate’s story part. It was silly. We laughed.

Lee commented, “In an artistic endeavor such as this you can’t get an ego attachment to your contribution that interferes with the final goal. If you do, you will end up getting your itsy-bitsy feelings hurt.” He also said, “The thing that bothered me a few times is that I got bulldozed on some ideas that I had, and in the end it turned out I was right and would have saved us an enormous amount of time and effort. However, in this type of endeavors, no-one gets their own way all the time.”

Both Victoria and Emily talked about conflicts over time management. Emily said, “I was very very slow, honestly. Very slow, honestly, and that made people mad, because they had to wait for me to finish my part. My Mom had to get on my case.”

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Although these conflicts were brought up, some with emotional fervor, each story ended with a satisfactory resolution.

***Physical Environment***. Eliah expressed a need for a common workspace or studio. She thought it would be good to work someplace else rather than at home. It would make it seem more like a real work environment and they could set it up with everything they needed organized for use. Mack said that when he was working on the first book he needed a personal computer, but now he had one so it was okay now. Emily asked for Photoshop, and better art supplies. She said she could work way faster if she could draw on Photoshop. Rosie also said she wanted Photoshop. Lee said that he needed a studio where his art and art materials could be left overnight. He also expressed a need for a big, high tech light table.

***Accomplishment***. Many of the participants expressed feelings of pride and accomplishment, which they received from working on the project, and described the skills they acquired. The students also agreed that they felt they had better job skills after working on the

project and felt more confident in their career goals. Their parents also observed the growth in their skills. This was just as important to eight-year-old Rosie as to Lee our college student. When I asked Rosie how she felt about making the book, she said, “Happy! I love making books! I loved making *The Pug Puppy*. I read it all the time. I show it to everybody. I did a show and tell of it, and my friends love it! I Photoshopped it! You taught me how to use Photoshop. We scanned it and put it on the computer and I colored the pictures.”

I asked, “What did you learn on Photoshop?”

Rosie said, “I learned that if I use the bucket thing that I have to close the black lines first or it colors the whole picture that color. I learned how to draw the dotty line around. Then I can

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make that part of the picture bigger or smaller or move it around. I learned to copy paste the flowers all over too. And if I didn’t like what color I could choose a different color with the dropper. It was so much fun!” Beth, Rosie’s mom also commented on her amazement at Rosie’s ability to learn Photoshop.

When the interviewer asked Mack, “How did you feel about working on the project?” He said, “Proud. Real good. I felt like I accomplished something. I feel like I’m an important part of designing this book. I felt confident and accomplished when I showed it to my friends.” Eliah, Emily’s mom said, “When she was finished it was amazing! She did something way beyond what we could ever have imagined that we can say was the truth. It was thrilling to be a part of something like that. She saw herself in an entirely different light. It opened up her future and how she saw herself in the future. Her entire world expanded.”

Emily herself said, “It definitely helped me with my future, I learned a lot about comic books. I’m fascinated with comic books and Manga. And it made me realize I could do it. I really learned how to create a comic, like a real manga artist! (She was dancing around the room as she said this) I felt it was surreal to see it actually in a book!”

Emily provided a long list of skills that she had required in working on her graphic novel portion of the book. She learned how to draw with Paint Tool Sai on a Wacom tablet. She refined her inking skills such as cross-Hatching, and lining using manga brushes. She learned techniques for drawing panels using graphic novel layout templates. She learned storyboarding. She was passionate and excited about all of these various skills that she learned as well as in developing her own manga style.

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Victoria the cover designer said, “It was soooooooo cool, when Jordan said, he’d pay 1000 dollars for my cover. It made me realize I’m a real illustrator. That’s why I’m going to SOU, this summer.” (Jordan is a published author, who writes gaming manuals. He hires artists to do art for his manual.)

***Social Emotional Environment.*** Eliah, one of the parents, said that one of the most important things she saw happening with her children in working on a cooperative project, was the social skills they had developed. She expressed how important this was for them to learn in the current work environment where artists to need to work together with other professionals, she saw that her children were learning to take criticism and adapt their work to fit the needs of the group as a whole. Eliah thought this skill, along with their growth in emotional maturity, was just as valuable as the book that they produced. She said about Emily, “She learned that the creative

process doesn’t wait for one person. She also learned her need for future growth. You don’t realize your weaknesses until you’re pushed to finish.”

Emily herself said, “I learned, I had to listen to the ideas of others and learn to understand their idea and not just do my own thing. Honestly, at first I was too stubborn.”

George, a former principal and teacher also commented on the importance of creating a cooperative social environment. He said the following, “I was in an advisory capacity as to how to make the various individual and group contributions come together to make the project a success. These kind of creative masterpieces are not done by people with a lone ranger mentality. All you have to do to realize this is to watch the ending credits from a movie like *Lord of the Rings*. There’s only one pitfall in cooperative learning and that is if the people in charge do not have the skills, the vision and the heart to make it successful. On a surface it might seem that a

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group project could hold back gifted individuals from achieving at their highest level, because other members of the team, who don’t not *seem* as brilliant, may hold them back. However, it is actually just the opposite. Done properly students who learn things more quickly, learn them much more thoroughly if they are in an environment where they can mentor others to be a part of a team that they’re all on. This is not to mention the opportunity to build important interpersonal skills, care for one another and learning to fit your contribution into a team effort as part of a whole.”

Lee also saw that this was one of the most important aspects of the project as well, that we had been successful in developing comradery, communication skills and an ability to work out problems with one another in a safe emotional environment. He said, “Along with Lena’s direction, we built a great comradery amongst the students and other gifted people involved. One

of the things I liked best about how our collaboration worked was the leadership’s ability to recognize individual gifts in all of us, in order to get the maximum contribution from everyone.” He also said in context of merging his skills with the skills of other individuals, “Cooperation with your fellow soldiers in this battle can make great friendships and outstanding results.”

***Planning and time management.*** Emily expressed her ideas for how to plan the next project better. Emily suggested sitting down with the person who created a particular character or sequence in the book that she was drawing, then sketching out a storyboard together and then agreeing on it before she did the final work. A need for a model of what a character was supposed to look like and their characteristics was something else she said she needed as an artist.

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Eliah talked about the difficulties about working with each other when they were separated physically. Some of us were in other states. Although she thought the system that we finally worked out in the end using Dropbox was working well, because we can combine it with talking to each other on the phone, while looking at pieces of art as we dropped them to each other. She thought that this would be a great plan for working with everyone that joined our project in the future to add them to our Dropbox communication system.

She also expressed a need for a time management and detailed project plans. She thought that we should break tasks down into smaller pieces and have a detailed check list for each piece of the project, and a deadline for when it would be completed. She talked about how this was the method she used as a corporate illustrator and it would be beneficial for students to learn to work this way to prepare them for professional work in their future careers. Each individual person

working on different aspects of the project could have their own checklist. She also said, “If we break the big task up in small pieces that way it would seem less overwhelming.”

Lee expressed a need to have a work schedule with planned breaks and time for hanging out and having fun together.

***Outliers.***  Emily expressed her love for and expertise in the art of Manga (a style of Japanese comic art), and went to great lengths to describe her art and specific techniques and skills she had acquired. She talked about various styles of manga, her favorite graphic novels and manga artists and what particular techniques they used. As the interviewer was typing her transcript she corrected her on every spelling of the names of the artists and graphic novels. This was the subject she most wanted to talk about. The interview with her went on for over a half an hour after the researcher asked the final question, “What have you been waiting for me to ask?”

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She replied, “What got you into Manga or comics?”

The interview would’ve gone on even longer if her mother hadn’t told her that it was time to do her homework.

Emily also expressed the desire to create her own characters for the next book. She showed me sketches of flower sprites that she had been working on. She had spent a lot of time on it. There were pages of these sprites in her sketchbook.

Mack had ideas of how to develop his talents in science and research into projects for the next book. Mack also had plans for enlisting his dad (an engineer) as a volunteer. He was more interested in future planning than analyzing the past project which he said was “perfect.” He had very detailed plans as to the exact types of projects that he wanted to do. He wanted to write scientific journal pages about imaginary creatures in the book that would be his own characters.

These characters would be developed through his research into ancient legends. He wanted to study the Native American legends of the Wendigo and the Skin Walker.

He also had ideas for various magical inventions, especially skyships. His idea was to use real engineering with his dad’s help. His dad is also an inventor with several patents. Mack’s

idea was for him and his dad to create engineering schematics for magical devices. He would also incorporate actual science into the designs, so that they would be plausible. He also talked about helping me develop a base eight numbering system for the fairy world that was very different from ours. That way he could incorporate his math skills into the project.

He was determined that he would do more on the next book and be more directly involved in the project than he had been before. He had been thinking about it for quite a while and planning for ways that his skills could be used. He said, “The only down side was that I

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wanted to do more, I’m not as good an artist as the other kids, or with writing stories. I’m really good at science though. I can write reports. I’d like to do a lot more on the next project. It made me feel good to be a part of it. I could add science to it, and engineering. I could do research. It would be fun to do more designs. I have a lot of ideas for designs, more stuff that I can do like design and engineering.”

**Discussion**

***Engaging and appealing aspects as well as the pitfalls that inform instructional and working practice.***When analyzing the data from the interviews for engaging and appealing aspects, the researcher looked for those issues that created the most emotional fervor in the participants. The number one appealing aspect was the idea of, “fun.” The actual word, “fun,” was used 21 times. What this means teaching practice is the need to keep it fun and plan for fun in future projects. It is an essential part of the learning process. There needs to be have Friday potlucks, celebrations when certain benchmarks are achieved, and time for brainstorming and just hanging out. Common lunch breaks are essential and since the project is in a city rich with artistic endeavors, field trips can be planned. This theme of fun and play enhancing the learning experience is in a lot of the literature. One article, “Happiness in Education,” describes the neurological process that takes place when the brain is flooded with endorphins from having fun and its enhancement of the learning process. The article shows how learning, especially memory, is enhanced by play (Noddings 2-4). There is an entire body of Reggio Literature from Italy documenting play, creativity and fun as being an important part of the learning process (Wurm, 6, 8-12, 23, 44-47).

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There were a lot of passionate feelings surrounding conflicts regarding the creative process, especially character design. In many of the interviews there was expressed the desire for people to have control over their own character development and be in charge of their own creations. In the corporate world this is called intellectual property and is an important issue. This means that whenever possible each student should have their own characters to work on that they are in charge of. For example, a second pug puppy with a pig-like nose in thecould have been added tothe *Pug Puppy* project. Nate could have had his own character separate from Rosie’s.

In applying this to working practice there are several tools that are used by professionals. One solution is to develop files that contain character profiles, which can be referenced by everyone working on the project. These files can be developed by the original creator and everyone else must be consistent with that original work. These files may eventually include intellectual property contracts as the project expands to include more people. This would prevent

many of the conflicts over character development. This kind of character development is taught in Miles Inada’s Concept Art class at Southern Oregon University and is the norm in the professional world (Inada). The use of storyboards as Emily suggested is also common in the

creative arts workplace. The idea she had of sitting down with the original author and storyboarding manga panels together is a good one, which we shall use in the future.

Another useful tool that was gleaned from the lectures of Dr. Warren Hedges at Southern Oregon University that is used in creative environments, is a rubric for various projects. They detail everything that it needed in order to produce an excellent product, but also make clearwhat

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would be sub-par. This will help with communication on a creative projects as well. (Hedges).

Another great idea to use in working practice would be to break down a larger task into small bite-size pieces and set a timeframe for each part. This was Eliah’s concept as a professional designer, and a practical one that we will use. I will also take her advice on finding a studio. One can be rented for as little as 200 dollars a month at the Creative Arts Center in Ashland. Lee and Victoria also expressed a need for a studio, or at least a separate environment set up for work. An article by David Raths, “Bringing down the Wall,” describes the use of collaborative technologies to enhance a group’s ability to work together. Eliah described this in her discussion of the use of Dropbox. Ideas suggested in the literature that would be helpful to look into is a collaborative web page, and the use of skype to collaborate internationally (39-42). Both Emily and Mack’s ideas for future projects will be included. Mack’s ideas for incorporating math, science and engineering were brilliant. An article that covers a publishing project that merged science, creative writing and art is “Increasing Secondary Teachers' Capacity

to Integrate the Arts” by Byron Richard and Christa Treichel (224-228).The article points out the value of illustrating scientific ideas and the increase in learning for both the artist and science

student. Emily’s flower fairies are beautiful and the entire collection can be included. An important point was brought out by George, the former principal. He talked about

more skilled students mentoring those who were still in the learning process. It would benefit both the peer tutor and the one being tutored. This is another fantastic idea that can be used in practice on the next project. The educational research on this idea bears him out. The study described in the article, “Making Meaning Together: Buddy Reading in a First Grade Classroom,” describes how the “buddy reading system” enhances reading skills not only

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for the one being tutored, but also increases proficiency of the student tutor as well. This article also measures intangibles such as motivation and goals for the future, both are increased when working in a peer environment (Flint 289-287). Another article that supports this conclusion is the OECD case study of Europaschule Linz in Innsbruck Austria, where the concept of “learning by teaching” in a foundational principle (Schrittesser et. al 2-13).

***The effect on students in forming their identities and career goals as well as the acquiring of professional skills, both practical and interpersonal?*** This aspect of the project was talked about by every participant in the study. Parents observed the skills both social emotional and practical that their children developed. The students themselves described the learning that took place. They not only expressed pride in their growth and in the development of their skills, but also in what they accomplished. From what they described, this aspect of the project was a great success. There were conflicts, but even these were seen in a positive light by the participants, since they were able to learn strategies for working out these conflicts and as a result experienced personal growth and confidence.

Many express an overall feeling of comradery and a sense of well-being and acceptance from being a part of the group endeavor. Comments like Emma’s, “I’m a real graphic novelist!” and the enthusiasm with which she said it is priceless. Rosie’s sense of self-worth when the other

children are playing Pug Puppy on the playground, because of the book she wrote, is valuable beyond words. Identities were formed career goals were enhanced professional skills were learned and interpersonal skills were developed. In the next project a plan for these types of

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learning experiences specifically, to nurture them and develop them should be included. In the book *Mind in the Making The Seven Essential Life Skills Every Child Needs,* Ellen Gilinsky argues that these kinds of interpersonal skills are more important to success in life than academics or a high IQ score (8-7).

**Conclusion**

There was a wealth of in-depth information gathered from this study. The interview that had the most impact, because it had such rich detail and careful thought out plans for the future, was the interview with Mack. He had worked quietly in the background, never revealing until the interview, how passionate he was about the book and his participation in it. It was very effective to end the interview with the open-ended question, “Is there anything that you have been waiting for me to ask?” It opened the flood gates on a barrage of information, ideas and plans that were buzzing around in his head.

There is a gap in the literature published in the US on cooperative project based learning, probably because there is a gap in the projects that are done like Rafer Thorne in the United States. What is needed are more collaborative learning environments and projects in teaching upper grade level students and more in-depth case studies of them like the ones done by Innovative Learning Environments( OECD 5-20).

One weakness this study has in influencing a change in the current school system is that it is qualitative and the evidence for students reaching educational benchmarks is not provided, except in the form of the observations of the parents and students themselves. This is because a qualitative case study in it methods, does not collect precise, measurable data that can be used as proof for a teaching method’s effectiveness. This study is useful as a model, is useful as a

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measurement of the attitudes and feelings of students, is useful for ideas, but does not provide convincing empirical evidence of specific learning.

Besides qualitative research there is a great need for quantitative research in the US, like what was done in some of the Chinese studies. “Social Networks Based Adaptive Pairing Strategies for Cooperative Learning,” measures the rate of learning before and after using pairing strategies, with rigorous achievement testing and measurable data, analyzed statistically. The study “The Effects of Cooperative Learning on Enhancing Hong Kong Fifth graders’ Achievement Goals, Autonomous Motivation in Reading Proficiency,” done by the University of Hong Kong is just as convincing in its empirical data. Both studies show over a 15 percent increase in the rate of learning in a cooperative setting that was measurable over a six month period. The other aspect of these two quantitative studies, which makes them convincing, is that the subject selection is broad and the number of participants in the studies measured in the hundreds (Chuang et. al 226-239; Law 205-225). Unfortunately, these two studies have little influence on our school system, being conducted in a learning environment and culture far removed from the US.

The weaknesses of this current study is that there were only 10 participants, and the time to complete it was limited, only three weeks from the time IRB approval was received. And although it was useful, it could not be used effectively as empirical evidence to prove a change needs to be made in how we teach our children in the United States.

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In the future there should be more quantitative studies that include empirical data based on learning objectives and measurable achievement as evidence that cooperative learning does actually increase proficiency and learning objectives achieved in students.

The research questions were more than answered by the literature and the interviews. Cooperative project-based learning was well-defined. A wealth of information and ideas to inform working practice was provided for the next project. The students were greatly impacted in their self-esteem, confidence, and career goals as well as gaining practical and interpersonal skills.

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