

Rowan University

## Rowan Digital Works

---

Theses and Dissertations

---

6-25-2007

### An investigation of an after-school science enrichment program

Jennifer Lyn Jamison  
*Rowan University*

Follow this and additional works at: <https://rdw.rowan.edu/etd>



Part of the [Junior High, Intermediate, Middle School Education and Teaching Commons](#)

---

#### Recommended Citation

Jamison, Jennifer Lyn, "An investigation of an after-school science enrichment program" (2007). *Theses and Dissertations*. 808.

<https://rdw.rowan.edu/etd/808>

This Thesis is brought to you for free and open access by Rowan Digital Works. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of Rowan Digital Works. For more information, please contact [graduateresearch@rowan.edu](mailto:graduateresearch@rowan.edu).

AN INVESTIGATION OF AN AFTER-SCHOOL  
SCIENCE ENRICHMENT PROGRAM

by  
Jennifer Lyn Jamison

A Thesis

Submitted in partial fulfillment of the requirements of the  
Masters of Science in Teaching Degree  
of  
The Graduate School  
at  
Rowan University

Approved by

Advisor

Date Approved June 25, 2007

© 2007 Jennifer Lyn Jamison

## ABSTRACT

Jennifer Lyn Jamison  
AN INVESTIGATION OF AN AFTER-SCHOOL  
SCIENCE ENRICHMENT PROGRAM  
2007

Dr. Marjorie Madden  
Masters of Science in Teaching Collaborative Education

The purpose of this study is to investigate an after-school science enrichment program and its components. The study was conducted in a middle school in the Evesham Township School District located in the Burlington County region of South Jersey. The participants included sixty-one students taken from the four sessions of the science program, three teachers of the program, twenty parents of the students, and the program director. Data sources included interviews held with each of the participants, anecdotal notes recorded in a teacher research journal, and student artifacts. I found positive results in the operation of the program, because of its characteristics: a supervisory council, a director, qualified staff, involved parents, interested students, space and materials, enjoyable age-appropriate activities, all in a safe environment with the financial means. The study implies that other after-school programs must be researched and evaluated in order to determine their positive effects. Further research in the study of after-school programs would be beneficial to educators if they focused on program quality and the involvement of qualified staff.

## ACKNOWLEDGEMENTS

I would like to take this opportunity to thank the people closest to me who have helped me along the way. Dr. Madden, this would have never been accomplished with another thesis advisor. Thank you for your help with guiding this project and proofreading the many drafts I have sent to you.

Next, I would like to thank my parents who have provide the opportunity for me to receive a higher education and have been patient with my use of their room for working on this project those many late nights.

I also want to take the time to thank my cooperative Aunt Debbie for setting me up with the program at her school. Thanks to her support and knowledge; this study could have never been done without her.

Last but certainly not least, I want to thank the rest of my family as well as my friends. Your support, pride, and compassion have made me who I am today and I thank you for your encouragement. One friend in particular, Brette, has also helped with the proofreading and looking at the study from an outside perspective. Finally, for those of you who care about education, I want to thank you for making a difference in many lives.

## TABLE OF CONTENTS

### Chapter One

Introduction.....	Page 1
Purpose Statement.....	Page 2
Statement of the Research Problem and Question.....	Page 3
Story of the Question.....	Page 4
Organization of the Thesis.....	Page 7

### Chapter Two

Review of the Literature.....	Page 8
Initiatives for After-School Programs.....	Page 8
Characteristics and Examples of After-School Programs.....	Page 10
New York City Beacons Program.....	Page 11
LA’s BEST (Better Educated Students for Tomorrow).....	Page 11
Big Brothers & Big Sisters of America, Inc.....	Page 12
Bridges to Success.....	Page 13
School-Based Youth Services Program.....	Page 13
CoZi Schools.....	Page 14
Participation.....	Page 15
Effects of Programs.....	Page 16
Concerns with After-School Programs.....	Page 19
Questions Left Unanswered.....	Page 20

## Chapter Three

Methodology.....	Page 22
Context of the Study.....	Page 22
Research Design.....	Page 28
Research Paradigm.....	Page 28
Data Collection Methods and Data Sources.....	Page 29
Analysis and Interpretation of Data.....	Page 30

## Chapter Four

Data Analysis.....	Page 31
Introduction.....	Page 31
Commitment to Academics.....	Page 31
Preparation for the Program.....	Page 33
Fun with Science.....	Page 34
Liquids.....	Page 34
Microscopes.....	Page 35
Mealworms.....	Page 35
Making Slime.....	Page 36
Filters.....	Page 36
It's Egg-credible.....	Page 37
Lesson Implications.....	Page 38
"Chemical Reactions".....	Page 38
Goals for Next Year.....	Page 41
Results of the Study.....	Page 42

Chapter Five

Summary and Discussion.....Page 46

    Conclusions.....Page 46

    Limitations..... Page 47

    Implications..... Page 48

    Recommendations.....Page 49

    Suggestions for Further Research..... Page 50

    Summary..... Page 50

References.....Page 52

Appendices.....Page 54

    Appendix A: Saturday Enrichment Club Teacher Application..... Page 55

    Appendix B: Saturday Enrichment Club Registration.....Page 56

    Appendix C: Permission Form..... Page 57

    Appendix D: Sample Lesson on Liquids..... Page 58

    Appendix E: Sample Lab Report..... Page 59

## LIST OF TABLES

Table 1: Interview Questions for the Director.....	Page 23
Table 2: Interview Questions for Teachers.....	Page 32
Table 3: Interview Questions for the Parents.....	Page 39
Table 4: Interview Questions for the Students.....	Page 40



## Chapter One

### Introduction

“A child educated only at school is an uneducated child.” It is no surprise that this profound statement, made in the late 19<sup>th</sup> century by philosopher George Santayana, remains relevant to modern times. Most people would agree that our school systems provide children with a great deal of information as far as how to survive in the real world. Yet, too often this enriching experience does not continue into the home. Whether or not Santayana meant for children to be educated by their parents, children should be involved in some form of learning experience every second of the day. Teachers could become involved in this process by coordinating the curriculum in school with the after-school programs as well as with the home environments. With teachers, parents, and the community working together to enhance the knowledge of our youth, students will be more prepared for their future.

Various types of after-school programs exist; yet what determines the shape they may take? Students in schools operating in lower income districts have the least access to after-school programs and they profit the most from them (Shumow, 2001). Whereas, Shumow argues, the programs in wealthier districts seem to be able to further enrich their students in ways these lower income districts cannot. Shumow (2001) also argues that schools who do not have access to programs, whether it is because of space, funding, or lack of staff can integrate with nearby schools that do. Whether or not money is a causal

factor in the quality of programs, they certainly have a correlating relationship. Many factors affect the types of after-school programs and therefore it is difficult to compare one program to the next. My focus here is on how one particular science program in an upper middle income district operates and what makes their enrichment program work.

### Purpose Statement

Much research conducted in education has historically focused on the school day in order to make improvements; fewer studies have been conducted on students' time out of school, leaving questions I have unanswered. My curiosity of how these programs operate and my experiences with after-school programs led me to my research study. Studies I have found discuss specific programs; however, with every program being different it becomes necessary to study many for a broader perspective. The initiative to implement after-school programs began over a decade ago, but evaluations of programs have yet to be completed Dryfoos (1999). Research describes various effects of after-school programs, though it seems to have mixed results (James-Burdumy, 2005). My study seeks to add to the research by looking closely at one particular enrichment program in the hopes of enhancing my understanding of after-school programs as a teacher.

Many problems arise when dealing with after-school programs, particularly since they lack the same support that the school day receives. Dryfoos (1999) identifies five main concerns: governance, space, program quality, funding, and accountability. Governance becomes a concern, because even though the school system holds the primary responsibility, the principal must work together with community-based organizations' directors for programs operated by them. As for the location, the issue of

space arises when outsiders use the school, even though many believe schools should be open for use. Program quality, including staff qualifications and the appropriateness of activities is also important to evaluate. Staff needs to be trained when implementing a program which can be costly (Fashola, 1998). Additionally, many programs do not provide age-appropriate activities (Fashola, 1998). Funding arises as a problem with any type of system, program, or organization that could be a causal factor in their effectiveness. The last and final concern lies in the accountability of these programs (Fashola, 1998). Programs often do not receive a formal evaluation (Dryfoos, 1999). There is little room to randomly assign placements for an evaluative study due to practicality, technicality, and ethical barriers. Another reason for the minimal evaluation of programs resides in determining outcomes and program effectiveness because it is so difficult to investigate the effects on school performance (Dryfoos, 1999). Fashola (1998) suggests that by looking at the goals of the programs and evaluating the proximity to those goals, an evaluation could be done. The problem with this evaluation exists in maintaining a sample of participants since programs are voluntary and students may not attend to each class.

#### Statement of the Research Problem and Question

What happens when students in grades two through five participate in an after-school science enrichment program? My research question looks at how an enrichment program in one school district enhances children's education. A second question becomes: How can teachers utilize programs to complement the curriculum of the classroom, increase academic achievement, and decrease problematic behavior? Focusing

on one particular program to find answers to these questions, I hope to learn more about ways to enhance the program and provide suggestions to the teaching faculty.

### Story of the Question

Just a few years back, a little girl named Jennifer attended an after-school child care program everyday until her mother ended the work day and could come pick her up. This particular year, she was in the third grade. Her brother, David, was in the fifth grade and no longer attended the program. One afternoon as Jennifer headed down to the all-purpose room after the school bell rang, she thought to herself, "I wish I could just go home right now. I can just as easily play games and finish my homework there and not have to worry about someone looking after me who doesn't even know me." Well, that could not happen until her parents arrived to take her home. "It's not fair. Why should David be allowed to go home alone? I'm more mature than he is. He doesn't even know how to clean up!" She decided not to attend CER (Community Education & Recreation) that day. "Hmmm. How can I leave school without getting into any trouble?" She nervously stood outside the all-purpose room door tapping her lip and hoping to come up with something fast. Suddenly, an idea came to mind. She thought, "I could easily tell the counselor I am helping Mrs. Q down the hall and just walk home. I have helped her before and no one checked on me. Yes, yes, that's it." Jennifer headed down to the all-purpose room, told the counselor she would be helping Mrs. Q that afternoon, and walked right out of the school. When Jennifer's mother came to her up, they informed her to check with Mrs. Q; she should be down there. When she could not find her daughter she angrily demanded, "What do you mean you don't know where she is? I don't believe this! She's not coming here anymore!"

Jennifer did make it home unharmed, graduated from high school, and went off to college to write this thesis. But, remembering my own experience, my concerns reside in what children today are doing after school and how teachers, such as myself, can be involved in making the time worthwhile. After observing various schools, students, and teachers, I felt I was finally ready to study what students are participating in after the bell rings. Today I am far more knowledgeable than when I was an eight year old and I can explain to my mother why the program just was not working and what my feelings truly were. I can also provide evidence to back my argument.

Coming up with a research topic to study seemed impossible at first. So many things are available for teachers to research and I was not sure about the type of environment in which I would be working. During my first internship, I conducted many observations, looking for problems or areas in need of improvement. Studying the aspects of after-school programs arose when I found many students having problems at home and not completing homework assignments. Several other topics came into play which left me with a serious decision to make. As many questions circled in my mind about after-school programs, I narrowed my topic to focus on one particular program and how that program works.

Referring back to the vignette, I had been interested in the topic since I was in elementary school. After the day that I walked out of the program, I was allowed to stay home alone. My mother no longer trusted the school; therefore, I was also no longer permitted to participate in after-school activities until middle school. I think to myself of how things may have been different if the staff had been better trained or the program better developed. When I reached high school, I applied to become an after-school aide at

the same elementary school that I had attended. I tried to implement change in the program. After helping the students with homework, not simply making them complete it, we would head outside for a group activity. The children were always ready to play the game of the day and many of them would never want to go home. The students looked up to me as their mentor and I enjoyed my time at work. But I could not change the other counselors. Instead of helping students with work, they often shouted, "Finish your homework" or "That homework better be done before your parents come to pick you up or you won't be going outside the rest of the week." The counselors would frequently sit around and talk to each other rather than interacting with the children. I returned to my school as a substitute teacher last year and the same staff still work in the after-school care program adhering to the same procedures as when I attended. I believe in hiring trained staff to run such programs and I hope to see how this can be implemented in my study. My elementary school program may just need more structure by following some sort of procedures and goals as the teachers adhere to throughout the school day.

The next part of my question is based on teachers utilizing after-school programs to complement the curriculum of the classroom, increase academic achievement, and decrease problematic behavior. In regards to free time, as teachers, we cannot control what parents do with their children; however, we can help the children become strong individuals and keep them occupied with educational activities. Boileau (2003) studied an after-school program which enticed parents as well as their children and found that by providing them with a meal and advertising the various activities available more people chose to attend. I am curious to find out how a program attracts students, while also providing instruction to increase their academic achievement. Students today have much

more to strive for as jobs with higher qualifications arise. As educational background becomes increasingly important in today's world, the study of after-school programs becomes critical. Schwarz, E., & Kay, K. (2006) looked at other countries which spend more time on academics and perform better than Americans. In my study of one after-school science enrichment program, I hope to add to the current knowledge we have about effective after-school programs.

### Organization of the Thesis

This study investigates one particular program and its components. Chapter Two considers current research on existing programs regarding their initiatives, the effects of programs, factors affecting after-school programs and the importance of evaluating them. Chapter Three discusses the context of the study as well as the research design. Chapter Four analyzes the data collected and discusses the results of the study. The final chapter, Chapter Five, interprets the findings, draws conclusions based on them, and discusses implications of the study for after-school programs.

## Chapter Two

### Review of the Literature

The present study presents an in-depth look at one after-school program. However, this study is informed by past and current research on after-school programs. The after-school program initiative began about a decade ago with the U.S. Department of Education working with several sponsor groups to study schools and their programs. Chapter two provides a review of the relevant literature regarding this initiative and how it takes shape today. It discusses the initiative, the characteristics and examples of after-school programs, participation, effects of programs, and concerns.

#### Initiatives for After-School Programs

After-school initiatives have occurred across the country and even been stressed by the government ever since the Alliance Schools Initiative to reform Texas schools began in 1992. Beachum-Bilby (1998) describes a teleconference with Al Gore where he explains his encouragement of school officials participating in the after-school movement and how schools should be used all day long. Schools in the northwest have become involved in a movement called “Making After School Count,” involving parents, community groups, school officials, politicians, members of the church, and business leaders (Beachum-Bilby, 1998). This movement (Making After School Count) across the country was an attempt to involve everyone in the community in their surrounding children’s education in order to get them off the street and to continue learning



(Beachum-Bilby, 1998). The officials, parents, politicians, church members, community groups, and business leaders involved in Making After School Count started by raising funds in Chicago. The U.S. Department of Education increased the funds for the 21<sup>st</sup> Century Community Learning Centers Program from \$40 million to \$1 billion (Beachum-Bilby, 1998). In order to reach educators around the country, the Charles Stewart Mott Foundation, the U.S. Department of Education, Fight Crime: Invest in Kids, the National Association of Elementary School Principals, the National Collaboration for Youth, the National Community Education Association, the National PTA, and the National School Boards Association and Partnership for Family Involvement in Education sponsored a video to be made about various after-school programs (Beachum-Bilby, 1998). Activities of several programs and interviews with their coordinators were portrayed in the video. The current leading national education initiative is Citizen Schools, implemented to revise after school education and partner with schools (Schwarz & Kay, 2006). The goals of the movement include having the students achieve skills for functioning appropriately outside of school and succeeding in our global economy (Schwarz & Kay, 2006).

J. A. Fox and S. A. Newman (1997) found students more likely to be involved in crime, sex, and drugs from the hours of three o'clock to eight o'clock, directly after school. By claiming the schools' use all day long, Gore felt in the long run it would benefit the community immensely with a reduction in crime, higher test scores, and more quality workers (Beachum-Bilby, 1998). According to the secretary of education, eighty percent of American parents want their children to be involved in enrichment programs, because if their children feel better about being in school and are more involved, then

they will feel better about themselves (Beachum-Bilby, 1998). The educators from Sam Houston Elementary School surveyed the parents from their district about their feelings toward their children's academics (Beachum-Bilby, 1998). The surveys resulted in parents more worried about the safety of their children and where they would be after school than they were about the actual grades (Beachum-Bilby, 1998). Businesses also want to support the programs and become involved, because in the future they need these children to be qualified and hard workers as to benefit the entire community (Beachum-Bilby, 1998).

### Characteristics and Examples of After-School Programs

After-school programs comprise many different activities, various characteristics, different staffing, and different locations. Caplan (1999) describes sixteen characteristics that each program should maintain and suggests programs that exemplify these characteristics. A climate for inclusion should revolve around information collected about students with special needs and how they can be met in the program and focuses on at-risk students. Community partnerships help involve surrounding companies, provide a greater opportunity to participate in various activities, and fund the programs. Coordination with the school and community organizations support the curriculum involved during the school day to connect with the goals of the program. Other characteristics to consider include: a culturally sensitive climate, an evaluation design, facilities management, leadership and governance, link between all personnel, parent involvement, public relations, recreational programming, safe and healthy environment, staffing: qualifications and training, and volunteers.

According to Policy Studies Associates for the After-School Corporation and the Southwest Educational Development Laboratory (Dessoiff, 2006), after-school activities do not have to focus on academics in order to be successful and effective. Students can experience new activities and also receive homework help. Fashola (1998) evaluated thirty-four programs and categorized them into five types based on the activities involved: language arts, study skills, academic enrichment for other areas, tutoring in reading, and community-based. Descriptions of several after-school programs are provided in this literature review in order to show examples of what some after-school programs look like.

#### New York City Beacons Program

The New York City Beacons Program purported to reduce crime in the surrounding areas, involve parents and the community in education, and promote youth development (Fashola, 1998). They are school-based community programs, where although they operate in certain schools, any child of school-age may attend. The activities revolve around enrichment through writing and reading programs and aim at developing skills in making decisions and conflict resolution. According to Fashola (1998), in order to become a Beacon Program, the school must implement a Community Advisory Council which includes teachers, parents, principals, organizations, and residents from the community. The Council advises program directors and follows up to make sure the goals are being achieved.

#### LA's BEST (Better Educated Students for Tomorrow)

The Los Angeles School District encouraged schools to administer the LA's BEST program. School faculty staff the programs under the school's direction, materials

are provided by the school, and the programs are located inside the school building (Dryfoos, 1999). All of the staff are qualified by the school and overseen by a site coordinator, who monitors the programs and ensures ongoing training by the tutors (Fashola, 1998). One of our country's most respected programs, "LA's BEST" help students complete homework, master computer skills, and learn about music and art (Beachum-Bilby, 1998). The 1995 study by the UCLA Center for Study of Evaluation conducted research for three years about "LA's BEST" and found improvement in grades for math, science, social studies, reading, and composition for those students who attended the program. They also found that increasing interests in other activities outside of academics reduced the incidence of crime by sixty-four percent. Evaluating "LA's BEST" programs is much easier than other programs, because they are only offered in districts that meet a certain criteria in order to reach the most vulnerable students. The criteria includes not having any other program available, poor academic performance by the students, and residing in unsafe neighborhoods (Beachum-Bilby, 1998). The program revolves around enrichment activities and begins with tutoring for help with completing homework. The ratio can be no more than fourteen students per tutor to ensure everyone has access to someone quickly. After homework is completed, the students become involved with the enrichment activities provided.

Big Brothers & Big Sisters of America, Inc.

Fashola (1998) found that Big Brothers & Big Sisters of America, Inc. was established in order to provide access to mentors for children who come from single parent homes. The program is funded by the U.S. Department of Justice and the staff consists of volunteers who have been screened. Mentors are expected to spend at least

four hours with their child every month and help them make healthy decisions about their lives by engaging them in positive experiences. Fashola (1998) found this program gaining more funding, because of its effectiveness.

### Bridges to Success

Bridges to Success is a community-based after-school program, which Dryfoos (1999) defines as an organization within the community collaborating with the school for convenience purposes through access to the students and their environment. These programs offer excellent sources from fields that exist out in the community and the world, though they tend to be a little costly (Dryfoos, 1999). People from various organizations manage the activities, though they utilize public funds along with private contributions (Dryfoos, 1999). The goals of the programs not only include the prevention of negative behaviors and a safe environment for students after school, but developing a community as well. As a result of involvement with community-based organizations, Dryfoos (1999) states that the school environment improves and bullying decreases. Bridges to Success was created in 1991 in Indianapolis and since then Dryfoos (1999) claims the program has spread. The program brings organizations to the schools to promote development through educational enrichment, life-skills training, career development, counseling, and recreation (Dryfoos, 1999).

### School-Based Youth Services Program

The New Jersey Department of Human Services implemented this program, which works alongside the school by following in-school activities (Dryfoos, 1999). Knowlton (2006) states that the School Based Youth Services Program (SBYSP) provides children with the opportunity to complete their education, to obtain skills that

lead to employment or additional education, and to lead a healthy life. SBYSP is the first statewide effort in the nation to place comprehensive services in or near schools (Knowlton, 2006). The program now operates in forty-five urban, rural, and suburban school districts, with at least one site per county (Knowlton, 2006). Knowlton (2006) describes the following program's services: crisis intervention, counseling, health services, drug and alcohol abuse counseling, employment training, summer and part-time job placement, referrals to community-based services, recreation, pregnancy prevention programs, and learning support services. This particular program describes its goals as keeping at risk students from dropping out and maintaining a healthier lifestyle. Students must have a referral in order to become a part of the program (Knowlton, 2006).

#### CoZi Schools

In this type of setting, the schools' programs are mixed and coordinated with the programs offered by the community organizations in order to spread services to a larger population. The school staff and community workers collaborate to provide more enrichment activities for the students. The goals of academic achievement and community development run alongside school-based programs and community-based organizations; however, community schools also want to incorporate parent involvement (Dryfoos (1999). The article identifies an example of this type of relationship with the "CoZi" schools, named after the two men who combined their suggestions: James Comer and Edward Zigler. By coming up with a form of child care that involved family support, the program offered home visits to children under three years old, all day care for children three to five, out of school care for children ages three to twelve and training for the staff.

Another study completed on various schools and all of the programs showed a broad mix of activities including the opportunity to build and master literacy and arts skills, connect with the community, explore new interests, and endure help with their homework (Dessoiff, 2006). Dryfoos (1999) feels that enrichment programs should provide attention to the students, connect with the community, and offer more time to be spent on academics. The ultimate goals of all programs, according to Dryfoos (1999), are recreation, academic achievement, a safe haven, reduction in crime, prevention high-risk behaviors, community development, and parent involvement. These goals validate the study of effective programs; however, community schools should operate alongside of the district's goals.

#### Participation

With mothers working more than before, an increased pressure for academic achievement, concerns for children not being supervised, and federal government funding increasing, more programs are in place and more students become involved (James-Burdumy, 2005). Research suggests that with more students becoming involved in programs, the programs need to be evaluated and improved to meet the needs of the students (James-Burdumy, 2005). Although many mothers are working, some remain home or are home in time to meet their children after school and therefore do not sign them up for programs. Fashola (1998) found in his study that children should be further enriched whether they attend programs or go home after school and programs should work with the community to develop ways to enhance education. Shumow (2001) found it complicated to compare students' participation as it decreased when students become older.

An after-school science program studied by Maria Ferreira (2002) targeted a specific group to participate in their study: African-American females. Her research showed inequities in gender and ethnic groups' involvement in the fields of science, math, and engineering. She focused on eighteen African-American females participating in a program initiated by the Society of Women Engineers, seven of whom were included in the staff to help with the curriculum so it would correlate with their careers. The results showed a gain in positive attitude toward math, science, and engineering as well as the possibility of them continuing in the program and advancing in those areas. Ferreira (2002) concluded that the program helped resolve inequities in those areas, though more research would need to be done, since the sample was so small.

#### Effects of Programs

The schools have much to contribute to children's after-school time through funding, space, and trained staff. With families having to work more often, children need extra attention after-school hours, since the school day is not long enough already (Dryfoos, 1999)! Shumow (2001) found an important result: students from high-risk backgrounds profit the most from after-school programs; however, they have the least access to these programs. Shumow argues that schools who do not have access to programs, whether it is because of space, funding, or lack of staff can integrate with nearby schools that do.

Dryfoos (1999) found that when students are involved with activities outside of school, the possibility for them to engage in risky behaviors decreases. A study conducted by the United States Department of Education surveyed eighteen different schools, where the results showed some students increasing academic achievement and



some with no effect at all (James-Burdumy, 2005). The objectives of the programs included: offering a safe environment for students to attend after school, improving academics, implementing various recreational activities, developing the students socially and emotionally, servicing working parents, and accommodating cultural opportunities. The most consistent activity was with homework help, though the results showed no impact on the reading test scores or grades. It did, however, show a decrease in absenteeism, make students feel safer, helped in getting along better with others, and improved self-esteem in that students involved in programs felt they were more likely to attend college. Shumow (2001) found that though academic achievement may not have increased, students did develop better work habits, attended school more often, and displayed less aggressive strategies for conflict resolution. Even the parents showed an increase in involvement with the school in attending events and volunteering. The teachers were difficult to cooperate with in terms of establishing an after-school curriculum and working with program directors on activities. Teachers, the study found, needed to become involved in their school community; even if they could not teach the program, they should work with the staff who can do it.

Fashola (1998) suggested effective components to be considered when implementing after-school programs: academic, recreational, and cultural. Academically, programs need to be tied to the school curriculum in order to enhance what students are already learning. Enrichment activities can be added to the program in order to open the students' minds to other things outside the daily curriculum. The instruction, however, must be by qualified staff in order to be effective and valuable. These requirements can be satisfied much easier within the same school that the students attend, although it

continues to be difficult recruiting the teachers from the school as they have already experienced a busy day, need to attend to their own children, or the funds may not be available to entice them (Fashola, 1998). As for the recreational aspect, these programs should enhance social skills and develop the concept of teamwork, provide role models for children, and allow for them to join a team when they could not afford to before. The importance of the cultural component stems from the issues of students developing their character and their role in the world. These programs need to help students develop life skills not normally taught in class, provide access to hobbies, teach interview and job skills, and bestow character education (Fashola, 1998).

Boileau (2003) included another component in providing effective programs, which has been discussed: parent involvement. The school she studied provided a program one night a week where families would come to the school together and engage in various activities. The goal was to motivate parents to work with schools and share information about how home life can be intertwined with school life. During the first part of the session, they participated as a family, eating together and enjoying an activity together. Then, the parents went into another room, where they learned about ways to help their child at home. The participation rate was high with almost eighty percent of parents attending at one point. Many positive outcomes resulted in academic achievement, parent-teacher relationships, and a greater source of volunteers. Parent involvement helped give parents information on how to help their child at home. This, in turn, also helped to increase time spent on academics. With other countries spending more time on academics, almost twice as much as the United States, Dryfoos (1999) suggests that our country needs to somehow implement instruction outside the school

day. In the case of Sam Houston Elementary School, mentioned earlier (Beachum-Bilby, 1998), parental involvement proved successful for the students in that a quality program helped increase reading scores by twenty-seven percent and self-esteem increased from the satisfaction of learning.

### Concerns with After-School Programs

Many issues are involved when dealing with after-school programs, since they lack the same support that the school day receives. Dryfoos (1999) identifies five main concerns: governance, space, program quality, funding, and accountability. Governance remains a concern, because even though the school system holds the primary responsibility, the principal must work together with community-based organizations' directors for programs operated by them. As for the location, the issue of space arises when outsiders use the school, even though many believe schools should be open for use by all. Using the students' environment helps programs run more smoothly and comfortably with ready supplies available; however, teachers have concerns with missing materials as things have been stolen or misused when they are not there to monitor them (James-Burdumy, 2005).

Another issue revolves around program quality, including staff qualifications and the appropriateness of activities. A high staff turnover rate presides among many programs and even among those who run them, which could be due to the dedication required to make these programs effective (James-Burdumy, 2005). Staff needs to be trained when implementing a program, which can cost much more (Fashola, 1998). Additionally, many programs are not providing age-appropriate activities (Fashola, 1998). Funding arises as a problem with any type of system, program, or organization

that exists due to the fact that people want to be compensated for their time and materials will need to be supplied. The funding for enrichment programs comes from public funds within the school, private funds from donations, or fees the parents must pay in order to have their children participate. The last and final concern, one which will be further discussed in this study, lies in the accountability of these programs. According to Dryfoos (1999), the programs do not receive a formal evaluation, but an opinion by somebody interested in looking at them. One of the reasons she states this occurs is that there is little room to randomly assign placements for an evaluative study due to practicality, technicality, and ethical barriers. Another reason for the minimal evaluation of programs resides in determining outcomes, because it is so difficult to investigate the effects on school performance. Fashola (1998) suggests that by looking at the goals of the programs and evaluating the proximity to those goals, an evaluation could be done. The problem with this evaluation exists in the participants and their attendance at the program. In order to complete evaluations, an advisory board could be setup, including representatives from the community (Fashola, 1998).

#### Questions Left Unanswered

After reviewing the current research about after-school programs, many questions remain about what can be done to improve time spent after school. With increasing numbers of people wanting to be involved in children's education, why is it so difficult to find trained staff and keep them? Another question asks how we can integrate after-school programs with school curriculum. Fashola (1998) calls for more research and stronger evaluations of programs in order to answer some of these questions. Although enthusiasm and an increase in the numbers of programs have grown, it remains a difficult

task to provide effective programs and no clear-cut answer can be given to what works and what does not.

In conclusion, more programs need to be evaluated in order to find an effective program, which teachers can utilize for extending curriculum instruction. Since the results of the programs' effectiveness are so mixed, each program should be looked at individually within a particular school, students, and faculty. A broad sample can practically only be completed if there is a vast number of students involved within one particular program. Some models of programs that have been implemented around the country are the Beacon schools, LA's BEST, Big Brothers & Big Sisters of America, Inc., Bridges to Success, the Youth Services Program, and the "CoZi" schools. Schools can use these programs to structure and implement after-school care. As for participation, more and more students are attending programs as well as more parents wanting to be involved in their child's education (James-Burdumy, 2005). Research suggests that evaluation of programs be ongoing by implementing councils for each district to conduct studies on effects of programs (Fashola, 1998). Although, it remains difficult to compare programs and participation, effectiveness can be looked at by studying a particular program for a length of time and finding what works and what does not (Dessoiff, 2006).

## Chapter 3

### Methodology

This chapter looks at the background of the study. It details the context of the study and provides a description of the demographics of the district. The chapter also discusses the research design and the procedures of the study.

#### Context of the Study

Upon consideration of an after-school program for my study, I chose a district that would provide me access as well as one where I could efficiently and accurately conduct the proper methodology for my research design. I discussed my topic with several educators whom I know personally in a number of different districts. I ultimately selected the Saturday Enrichment Program at Marlton Middle School as my choice for the study.

Marlton Middle School is located in the Evesham Township School District, part of the Burlington County region of South Jersey, commonly referred to as Marlton, New Jersey. Evesham Township is a kindergarten through eighth grade district comprised of seven elementary schools and two middle schools. According to the United States Census Bureau 2000, Evesham Township is a predominantly white community with 75.1% Caucasian population. Demographics of the other races include: 12.3% African American, 0.9% American Indian, 3.6% Asian, 0.1% Pacific Islander, and 7.9% of other races. The median family income falls between \$50,000.00 and \$74,499.99 with only 9.2% of families falling below the poverty line. 70.7% of residents over the age of 16 are

employed in occupations ranging from construction and maintenance to management and professional positions. (US Census Bureau, 2000)

Although a number of after-school programs are held at each of the schools in Evesham Township, they are offered only to students attending that particular school. There is only one program that consists of a diverse student body, open to any student within the district and this was held at Marlton Middle School. Therefore, not only was I choosing a unique program, but I was also able to study a program with a diverse population. Multiple interviews with the program director and administrator, who has been involved with the Saturday Enrichment Programs for the past eight years, provided me with background information and an understanding of how the program is being operated today. Refer to Table 1 for the interview questions asked of the director.

Table 1: Interview Questions for the Director

1. How did the program evolve and how long has it been in place?
2. I understand it revolves around the Tier II and Tier III requirements for enrichment programs. Could you explain this?
3. What role does the Superintendent's Advisory Council play in the process and implementation of the program?
4. Who decided on the location and what space is used?
5. Are the programs evaluated and have you seen any prominent effects on the students' performance?
6. In terms of governance, who runs the program and who is accountable for it?
7. How long have you been involved in the program?
8. I understand you send out applications to teachers in the district. Is it difficult to get others (qualified) involved?

The Evesham Township school district offers Saturday Enrichment Programs for eight weeks every school year upon recommendation by the Superintendent's Advisory Council and as part of the Evesham Township Tier Three Enrichment Program. The Superintendent's Advisory Council does not play a huge role in the implementation of the program; rather their approval is necessary for any decision-making proposals. The program was initiated in 1993 by a board member's request to offer enrichment opportunities to third and fourth graders. At this time, the only students eligible for involvement within the program were those from the gifted and talented program, since the board member felt that they were not receiving enough enrichment during the school day. It ran for three years. In 1998 the enrichment program began, but now allowed all third and fourth graders to be involved, not solely the gifted and talented students. In 2004, the program's new director proposed to the Assistant Superintendent that opening up the program to students in second and fifth grades would be beneficial for these students, too. The Assistant Superintendent agreed with her proposal; however, all decisions for the program must receive final approval by the Superintendent's Advisory Council, which takes place in board meetings. The committee members include two board members, the Superintendent, the Assistant Superintendent of Curriculum, rotating supervisors, rotating administrators, and teachers are invited. The decisions for second and fifth grade to participate were approved in 2004 with more and more students participating each year.

The program coordinator makes the decision of the location depending upon the student turnout and need for materials, though they are usually held at one of the middle schools to provide students the opportunity to work in the labs. Since the program runs on



Saturday mornings, more classrooms are available for use at this time. The Assistant Superintendent provides the final approval for each program and its instructors. It was elected that the enrichment program be held at Marlton Middle School this year for use of the science laboratories. In regards to evaluation, no formal evaluation takes place under the director's supervision; however, the teachers assess their individual clubs and status of the class. The teachers come from within the district; however, even though they receive compensation, it is difficult to recruit qualified staff.

Depending upon the educators involved and the number of participants, various programs of study are selected, such as Theatre, Cooking, Science, Culture, Art, Architecture, Journalism, or any other unit plan developed by the teachers. The director of the programs posts a memorandum in each of the schools to recruit professional staff for positions in the enrichment clubs. Interested staff must complete an application for the position indicating which program they would like to participate in or if they plan on creating a new syllabus (see Appendix A). All clubs must meet the qualifications for Tier II or Tier III Enrichment. The criteria for Tier II Enrichment is more advanced and concerned with higher order thinking processes: critical thinking, problem solving, inquiry training, divergent thinking, research skills, and creative thinking. The criteria for Tier III Enrichment focuses on individual and small group investigations of real problems so that students become experts through first hand investigation. It is for students who exhibit high levels of ability, creativity, and task commitment. All staff involved in the program will be compensated for their time at a rate of \$20.66 per hour with sixteen to thirty-two hours per session. If a teacher decides to develop and submit a syllabus for a new club and they are approved, they could be compensated for up to ten hours at the

contracted rate of \$27.23 per hour. All non-certified staff are compensated for their time at a rate of \$10.00 per hour. The director informed me that recruiting qualified teachers remains difficult due to the dedication required to make it effective. She commented, “Many teachers have prior commitments on the weekends with their families and don’t want to give up their Saturdays.” Consequently, there is a high staff turnover rate amongst the teachers, in fact the prior director left the program to become involved with other activities within the district.

The characteristics of intelligent behavior adapted from the work of Arthur Costa of California State University sets the goals for the Tier II and Tier III Enrichment Clubs. The goals form the basis of club evaluation and student assessment in the clubs. They include: persistence and persevering, listening to others, flexibility in thinking, metacognition (awareness of own thinking), checking for accuracy and precision, ingenuity, originality, insightfulness, creativity, depth of understanding, and applying prior knowledge by making connections. Teachers evaluate their individual programs by assessing student interest and prior knowledge following up with observations of what the students have learned and how they have addressed these goals.

Once interested teachers have sent in their applications and programs are selected, a letter goes home to the parents of each child in second through fifth grade in the Evesham Township school district announcing the start of the program for the year. The letter includes the dates of the program, the location, and the cost. Transportation is not provided to the Saturday programs. Parents are to fill out a registration form with contact information, a designation of which sessions they wish to attend, and an indication of any medical conditions the child may have (see Appendix B). Registrations are honored on a

first come first serve basis and space is limited due to the number of teachers involved and programs offered. The cost for each one and a half hour session is eighty dollars and must be sent in full with the registration by the due date in order to participate. The money is put toward teacher salary, materials needed for experiments, and supplies for the party at the end of the program. The director informed me that if the program was not self-sufficient, it would not be taking place in this district, because there is no money for a Saturday Enrichment Program. Scholarships are also offered to a few children who really wanted to attend, but whose parents could not afford it. Currently, with the increase in enrollment, the enrichment program is beginning to accumulate a budget and having extra money. The director also enlightened me by stating, "If none of the parents in this district could afford it or if I worked in a lower economical atmosphere, I would seek out sponsors from the surrounding businesses to help cover the cost."

The Saturday Enrichment Program I studied offered three clubs for the students: Curtain's Up, Cooking around the World, and the Scientist as a Detective. Due to my focus on academic enrichment, the science club became the focal point of this study. The participants include the second through fifth graders enrolled in the each of the four sessions of science, the parents of these students, the teachers for each of the sessions, and the director. The students totaled sixty-one: twenty-two second graders, fourteen third graders, sixteen fourth graders, and nine fifth graders. The gender ratio of the class was about equal; thirty students were male and thirty-one were female. The director was able to divide the students into heterogeneous age groups, keeping second graders with third and fourth graders with fifth. Two sessions of clubs were held each Saturday and three teachers were involved with the science club.

## Research Design

### Research Paradigm

The efforts to construct a knowledge base for teaching have historically relied on research conducted at the university level and not from the standpoint of teachers themselves (Cochran-Smith, 1993). A qualitative study is the study of classroom ecology and draws from anthropology, sociology, linguistics, and traditional qualitative research (Cochran-Smith, 1993). Every classroom is different and this becomes important in teacher research. Cochran and Lytle (1993) find with such a complex, context-specific, and interactive activity, teacher research must provide detailed information to enable a descriptive study. Cochran-Smith and Lytle (1993) define teacher research as a systematic, intentional inquiry by teachers about their own school and classroom work, sometimes referred to as action research. Action research strives to compare the effects of social action and the research leading to the social action. With the subjectivity of the researcher, teacher research unquestionably consists of qualitative data in that it is an interpretive study including an in-depth interview process. It provides teachers the opportunity to fortify judgments and improve their teaching practices.

A qualitative study identifies questions, documents observations, analyzes and interprets data, and shares the results with others. I chose to implement qualitative research in order to examine my practice as a teacher and explore questions within that practice. By conducting action research, as a teacher, it allows for me to take a closer look at what is available to me and how it operates. It is essential in the study of education to perform, implement, and share teacher research. As Cochran-Smith and

Lytle have stated, too little research has been completed by teachers and there is much to learn from it.

#### Data Collection Methods and Data Sources

Prior to beginning my research, through the completion of an online course, I gained a certification of the Human Participant Protections Education of Research Teams. After completing the course, an application was submitted to the Institutional Research Board at Rowan University in order to receive approval for my research. Once approved by Rowan, a permission form from the director of the Saturday Enrichment Program provided me consent to begin the study. The research data comes from a variety of sources in order to examine multiple aspects of an after-school program. When working with the program, I took note as to how the program deals with each of the issues discussed in Chapter Two: governance, space, program quality, funding, and accountability. These issues become important factors for my study in understanding one particular program and suggesting possibilities for change.

The sources of data provide an opportunity for understanding multiple perspectives. The first source consists of field notes recorded in a teacher research journal. This holds all of the information about the history of the programs offered during the Saturday Enrichment Program and focuses on the particular club studied. Also, it includes the aspects of the program: its funding, staff, curriculum, goals, and participants. Interviews, a second data source, have been conducted with the director, teachers, students, and parents about their thoughts on the program and what they believe is valuable. The first interview was with the director to discover the history of the enrichment program and how it operates. I continued the interviews with the three

teachers and asked each to complete the questionnaire. As parents dropped off their children and picked them up, I stood with them and conducted informal interviews asking for their opinions of the program. During these informal interviews with the parents, a permission form was distributed requesting an interview with their children (see Appendix C). Parents signed the form at that time, allowing for a return in a timely manner. Other data consisted of records of the various experiments students completed in the program; these records assisted in explaining the goals of the program and how they are achieved. When interviewing the students, it was during the experiments when they were with their lab partners. It was also informal and I told them I was looking for information about the program to assist my study to be a teacher. All students involved were able to participate in the interviews with parental consent.

#### Analysis and Interpretation of Data

After looking at the background information of the program and how it operates administratively, I reviewed the results of the interviews and studied the various perspectives offered of the director, teachers, parents, and students. I looked across the data to gain a fuller understanding of its contents and organized the data into categories. The next chapter discusses the data analysis and the findings of the study.

## Chapter 4

### Data Analysis

#### Introduction

Throughout this chapter, I focus on the results of the study of an after-school science enrichment program. I address the essential question: What happens when students in grades two through five participate in an after-school science enrichment program? I look at the data found about the program itself, the results of the interviews with faculty, students, and parents, and my teacher research journal. Through an analysis of these different components, I discuss my findings through the lenses of five major areas: commitment to academics, preparation for the program, fun with science, “chemical reactions”, and goals for next year.

#### Commitment to Academics

With the Superintendent’s Advisory Council’s commitment to excellence and approving all decisions, the Saturday Enrichment Program was initiated. This program ties to the district’s curriculum in order to enhance what students are already learning. Enrichment activities are added to the program with the purpose of opening students’ minds to other things outside the daily curriculum. These requirements are able to be satisfied much easier since the program operates within the same district that the students attend. The director of the program is in charge of recruiting teachers, contacting parents, collecting money, determining which programs will be implemented, and ensuring each

child's accommodations. Once these jobs have been accomplished, the director can rely on the teachers for support and the enactment of the program. "With the dedication of the educators involved in the program, we hope to provide an atmosphere for students to experiment with hands-on science activities," the director of Saturday Enrichment programs remarked. This allows for students to receive a more in depth understanding of science and how it operates to real life events. Interviews with the teachers involved in the science program (see Table 2 for interview questions), showed their commitment to enriching students outside the classroom doors.

Table 2: Interview Questions for Teachers

1. Why did you become involved with the program?
2. How do you develop your lessons?
3. What were the goals for the program and were they accomplished?
4. Do you think the program was effective?
5. How do you assess the students' overall performance?
6. Will you teach the program again?
7. What would you change for next year?

The science program had such a good turnout this year that they needed three science teachers between the four sessions of classes. There were three teacher participants, Mr. Z, Mrs. R, and Mrs. P, for my interviews whose comments showed commitment to the program. "It's so interesting to see the students involved in academics outside of the classroom. This was the first year I could partake in the program and I jumped at the opportunity," Mrs. P commented. All teachers were very interested in



science and believed that children should be exposed to hands-on science at an earlier age than happens in the elementary grades.

The teachers collaborated in setting attainable goals for their program this year. Mrs. R stated that one of the goals and purpose for their individual program was “to have fun by making science fun.” Another goal was simply to do more with science, since the school day does not allow for too much time to be spent on it, which has definitely been accomplished. “We feel that students in the elementary setting are not receiving the instruction in science that is necessary to develop basic skills in the subject matter,” Mr. Z claimed. The overall goal was for students to discover science as an interesting subject and become more aware of what it is. Their goals were achievable and teachers commented that they were pleased with the end results. All three teachers assertively agreed that the program was effective in reaching their goals. Mrs. P expressed this in a final remark: “The enrichment program provided the students with the opportunity to experiment with concepts of science in a fun way.”

#### Preparation for the Program

The three teachers collaborate on lesson planning and try the experiments out first to see what works. Mr. Z exclaimed, “We have a great time experimenting with the lessons and learn something new about science each time!” They use e-mail as a frequent communication method. Many of the ideas come from the unit plan, “The Scientist as a Detective,” which one of the prior teachers created for the program. Also, ideas are found in a book of teacher created materials containing various science experiments relevant to the club’s activities. The teachers, after planning the first two weeks, ask the students for ideas to see what they would be interested in learning at the program. “We want to make

science enjoyable for them and ask for their opinion on which experiments they like to do or what they want to learn about. It helps in gaining and keeping their interest in the subject matter,” Mrs. R explained.

The middle school teachers have no problem with the program using their students’ environment and are not concerned with the use of classroom materials. They also have access to the cafeteria and auditorium, providing a safe place for students and parents to arrive at to meet their teachers. Before everyone arrives, the director runs around to make sure all classrooms are available and a janitor is on duty. “Something always arises first thing in the morning, like there are no paper towels in the labs and I need the janitor to bring more or keys are missing and we can’t get into one of the rooms,” the director explained. Much preparation is needed for the science program and the support of all staff is necessary in making the program run smoothly.

### Fun with Science

#### Liquids

One of the experiments conducted during the program dealt with liquids and surface tension (see Appendix D for a sample lesson plan). Students were provided with a plastic cup, which they were to fill up to one third with water. Mrs. R then poured oil into their cups and students recorded what they saw: “They aren’t mixing together Mrs. R. The oil stays on top of the water. How come?” one of the second graders asked. The students were directed to write down their observations on their lab report (see Appendix E for sample) and at the end of the experiment they would discuss the results. I went around to pour alcohol on top of their mixture and was greeted with an amazed child, “Miss Jamison, look at what it’s doing! Even when I swirl it around, they don’t mix!”

After everyone received the chance to complete the experiment the students discussed the density of liquids. They came to the conclusion that water is denser than oil, which is denser than alcohol.

### Microscopes

Working with the Saturday Enrichment Program for eight weeks provided me the opportunity to see each lesson implemented. My first day in one of the science classes revolved around working with students using the microscopes. Prior to using the microscopes the teacher directed the students to how to operate them so you can adjust the image of each object and view them from various lens. We were able to see flowers, onion peels, and ink blots up close with each student operating their own microscope. It was interesting to see how the students responded to a different look at objects. "Check mine out! You can see where the insides of the flower! This is so cool!" one of the students exclaimed.

### Mealworms

Another experiment was a lot of fun to work with because we could make a mess. The teacher brought in the class a bunch of mealworms to study and investigate. These mealworms were not harmful, but needed to be carefully watched, because they crawled everywhere. Students were directed to create tunnels for them to crawl to and placed food sources around to see what mealworms were attracted to. They placed piles of sugar around their lab tables and pieces of banana to see if they liked fruit. "Mine likes the banana the best, he keeps crawling all over it!" one of the students shouted. Then, they were directed to bury a couple mealworms in a cup of sugar to watch them tunnel out. "And the race is on! Who's gonna get to the top first? Look, I see a head poking through!"

Ladies and gentleman, we have a winner!” an eager little boy announced. This enjoyable experiment ended with a lot of cleanup from each of the students, who worked cooperatively together.

### Making Slime

“Did you say slime?” asked one of the girls in the next class. “We get to make slime today? This is so cool!” Students were provided with their own cups of the solution. They were given a stick to stir the two solutions together until it starts to form a gelatin. I was able to give the students drops of food coloring of their choice to add to the solution. Students were asked not to mix the solution too fast, because it would spill out and they would lose some of their slime. This was not the case with the second graders; slime went everywhere! The teacher for this class was tolerant of the mess, “It’s okay. Keep stirring, we’ll clean up at the end of class.” Once the slime was made, they were allowed to visit other lab tables to help students with their slime or check out how it turned out. “Wow, yours is such a cool color and it’s really sticky,” a student shared with his friend. Another messy experiment in the lab ended in cleanup, but this time they could take their experiment home with them and the teacher provided each student with a copy of the ingredients.

### Filters

As a class, students were asked how they thought their water was filtered so it would be clean enough to drink. Students provided various answers, “They have big machines it runs through and takes out the dirt.” “They burn it to melt away the bad chemicals.” The teacher informed them about the experiment they would conduct to see if they could filter water from an oil-based solution using various supplies provided.

Students were given a cup and directed to make layers of cotton balls, cat litter, and coffee filters. The teacher then went around pouring the “dirty” solution through their filters to see if it would work. We ended up having mixed results but for the most part we were not successful in filtering the water and decided that, “We can’t drink this!” The students continued to experiment with making layers of filters and each time they filtered the water did get a little cleaner, but never enough. “How can people make filters that actually work?” questioned a little boy providing us with something to research. “It would not be easy, replied the little girl next to him.”

It’s Egg-credible

The last day of the program, family and friends were invited to work on a fun experiment with the students. A letter was sent home regarding the big event and what they could bring in for extra supplies. Everyone was directed to build a protective shell around an egg to keep it from breaking when we dropped it from the ceiling. One of the students asked, “Can we use anything we want to put around the egg?” They brought in such materials as cardboard, string, duck tape, bubble wrap, and cotton balls. Parents were readily waiting for their children to direct them in the procedure. “Let me know how you would like to make this. I’m here to help,” another parent told their child. Everyone was busily working because they had a limited time to create their project. Some of them dared to test it out by dropping their container with an egg from the tables. Once the experiments were completed, we headed down to the auditorium to watch the “Egg Drop.” Mr. Z went up the fork lift with everyone’s creation and began dropping containers. It was my job to cut them apart to see if the egg survived. Students were surrounding me eagerly waiting to see which ones made it and which ones did not. “Mine

survived! I knew that extra duck tape would work!” Mom, come look!” an excited little boy shouted. After all the excitement, we enjoyed refreshments and talked about the other exciting experiments in science class.

### Lesson Implications

Through observation and involvement in the lessons implemented by the teachers, I was able to determine that they reached their overall goal for the program for the students to have fun and become more aware of science. The interesting experiments were both enjoyable as well as enriching for the students and the teachers. A learning community was established even though the program was only eight weeks long. The students were involved in deciding on what experiments to conduct and the parents even had the opportunity to come at the end to see and partake in an example of one of the experiments. It was exciting to be involved in the program and the students and teachers viewed me as a participant instead of just a researcher. The lessons showed the teachers’ commitment to the science enrichment program and allowed for me as a researcher to view the impact they have on the students.

### “Chemical Reactions”

Parents were required to drop off their students at one of the entrances by the gym and pick them up by the library. During these procedures, I was able to talk with each of the parents about their opinion of the program (see Table 3 for interview questions). For most parents this was their first time sending children to the enrichment program and they expressed their gratitude for its existence. The reason they sent their children to the program was because of the wonderful things they have heard about it from other parents and teachers as well as agreeing with educators that science instruction was not up to

parental expectations for their children during normal school hours. Parents of the students currently in the program had also heard about the fun learning activities involved and how the teachers incorporated a hands-on science approach. These parents were also looking for ways, in which they could enrich their children's knowledge at home, activities which they felt were provided by the program.

Table 3: Interview Questions for the Parents

1. Is this your first time sending children to the enrichment program?
2. Why did you send them here?
3. What have you heard about the program and what is your opinion of it?
4. What do you think of the program?
5. Would you send your child again?
6. Would you refer the program to other parents?

Parents agreed that they would certainly send their children here again and some of them have even written letters to the Superintendent expressing their appreciation of the teachers and what the program had done for their child. A parent responded, "I wish the program could be offered more throughout the school year or even during the summer. It's a great place for kids to come to and have fun while learning." They couldn't wait to send their child here again and the money seemed to be no factor. "I don't mind paying for my child to participate. It helps him enjoy learning and that's important to me," a caring parent expressed. Certainly, parents involved with the program this year have referred other parents to it. Overall, each parent was pleased with the results and look forward to working with teachers for sake of their children's education.

Students were interviewed according to eight questions regarding their perspectives of the science enrichment program (see Table 4 for interview questions).

Table 4: Interview Questions for the Students

1. What made you come to the science program?
2. What do you like about science?
3. What do you do for science in school?
4. How much do you like science?
5. What part of science are you most interested in?
6. Would you come to the program again?
7. How does participating in this program affect your attitude toward science?
8. What did you do? Did you learn what you expected and wanted to learn?

When asked “What made you come to the science program?” they offered various responses. Most of the students wanted to do science because they love experiments and they do not get to do them during the regular school day. Some students shrugged their shoulders and claimed, “I just like science a lot and always want to learn more about it.” Very few students murmured something about their parents making them come to the program. The students informed me about their favorite part of science, “The experiments!” Some of the favorite experiments were making slime, dropping eggs from a carton they made to see if they would break, and studying forms of matter under a microscope.

The younger students in second and third grades claimed they did not even have science at their school so this was their first in performing any experiments. The older



students informed me about some of the experiments that they have done; one of their favorites was making volcanoes. Students had varying opinions about their feelings toward science: most of them announced a lot, some of them shrugged it is okay, and a couple whispered they did not like science, but they liked doing experiments! “We can’t wait to come here again next year. And next when I come I’m gonna tell Mrs. R a cool experiment for everyone to do!” a shy third grader positively stated. Other students wished to come, but added, “If my parents let me.” I questioned the students about participating in this program and how it affected their attitude toward science and they replied that it made them enjoy science even more. The final question asked was, “Did you learn what you expected and wanted to learn?” They all gave a sincere yes and stated they would not change it one bit. “We learned about keeping track of our experiments so we could do them again, but the best thing we learned was how to make slime!” a little girl informed.

#### Goals for Next Year

Many teachers have families and prior commitments on the weekend so the director, reflecting back, plans on sending out the memorandum earlier in the year in hopes that teachers would become interested and put it into their schedules. Also, with help from this year’s teachers, she hopes to express the satisfaction in teaching the program and becoming involved with the students in an informal academic setting. If they are able to involve more teachers, than they will be able to schedule a greater number of programs for the students to participate in. The director commented, “Hopefully, each year this program will continue to grow as it has been and we can entice more students to participate.”

Students' overall performance was assessed primarily through observation and the results of their experiments; the students also kept a lab log for each experiment. The teachers reported that their wish is not to assess the students formally; however, next year they might attempt to correlate the program with the science teachers in the elementary schools or even the middle schools. Mrs. P proclaimed, "It would be nice to connect this entertaining atmosphere with the classroom so the students can relate the subject matter; however, time constraints make that difficult."

Each of the science instructors responded with an astounding yes when asked if they would teach the program again. Mrs. P exclaimed, "I absolutely loved it! I wish the program would have been longer; it went by so fast!" As for changing anything in the next year's syllabus they agreed that because of the large numbers of students they would change the grouping of the students. The students should have been split between those of a higher ability and a group just to have fun otherwise they would not change anything else. "I thoroughly enjoyed my time spent preparing and implementing lessons; however, the students academic levels varied so greatly it would be more beneficial for the students if they were able to work with others on their level," Mr. Z remarked. I observed the students helping each other when working in the labs and though the teachers could implement a various levels of thinking if the class were stratified, I feel as though it worked well having different abilities in one class and this should not be one of their changes.

### Results of the Study

The Saturday Enrichment Program at Marlton Middle School offered many high-quality learning activities and has come a long way in doing this. The current director

began facing obstacles when getting the program approved by the Superintendent's Advisory Council. Also, as Vice Principal at DeMasi Middle School, she had much to take care of when the school year began. Recruiting teachers for the program needed to be done in a short amount of time and it was difficult to accomplish. The teachers are compensated for their time at the program; yet, the director expressed that it was not enough to entice them to give up their Saturdays. Once the registration began, keeping track of all of the students was overwhelming. In the middle of one of the sessions, the fire alarm went off, which affected the rest of the afternoon. Another Saturday, the program had to be cancelled due to a snow storm. This extended the program another week, but also prevented some students from attending the last day since they had prior commitments. Sudden situations such as these arise and become obstacles when implementing a program after school.

Teachers and directors are accountable for any actions occurring throughout the program. This program, along with others, does not receive a formal evaluation due to the difficulty of such a task. Randomly assigning placements to set up an evaluative study could not be done due to practicality, technicality, and ethical barriers. The director can not decide which student will be involved in which program, because it is not a requirement and the students have the right to choose. Also, without knowing which students will attend on which day, it would be complicated to review the overall effectiveness for each child. The elementary schools in the district do not follow strict guidelines in implementing science; therefore teachers could not always correlate the subject matter and compare academic achievement. Even though it is difficult to determine the effects on students' academic performance, the teachers interviewed feel as

though the students do perform at a higher level as a result of the program. One of the teachers reflected on the first lesson, “The students were looking for answers from me and I told them that they had to find the answers and explore their questions on their own. That’s what experimenting is. You may not come up with the same result as the person next to you and you need to find out why.” The other teachers agreed and commented on how much the students had grown in their thinking processes by the end of the program.

The program was successful as measured by the parents’ and students’ appreciation at the end. Each of the experiments went well and helped the students to develop an open mind in science. Students also had the opportunity to hypothesize and conduct tests to find out answers to their questions about science. The programs were approved as quality programs prior to their implementation and they were successful in adhering to the Tier II and Tier III enrichment requirements. Evaluations were conducted by setting goals and looking at how these goals were reached. The dedicated educators involved created an environment that not only exposed the students to science, but challenged their thinking.

In conclusion, the several concerns with after-school programs indicated by Dryfoos (1999) were revealed in my study: governance, space, program quality, funding, and accountability. The program was governed by the Superintendent’s Advisory Council, which approved decisions; however, was not involved in formal evaluations of the program. As for space, it is essential factor in implementing after-school programs and in this case, they had many classrooms yet students were limited because of the small number of teachers. The programs were established based on the syllabi created by teachers and approved by the Superintendent’s Advisory Council, so they were of high

quality. For this particular program, funding was not an issue, because the parents paid a registration fee which covered all costs. Teachers were accountable for their individual programs and reported to the director if there were any contingencies. Providing the program with trained staff members becomes costly and difficult as Fashola (1998) indicated. The director of the program informed that teachers were difficult to recruit due to the day of the week and the compensation was not enough. The Saturday Enrichment Program at Marlton Middle School was able to involve the parents of its participants at the end of the program. Boileau (2003) found this factor essential to implementing after-school programs and continuing education beyond the school day. I also found this imperative to my study with the parents' commitment to their children's education and performing the activities at home as well. Overall, the Saturday Enrichment Program held at the Marlton Middle School exemplified characteristics of a successful program.

## Chapter Five

### Summary and Discussion

#### Conclusions

The purpose of this study was to gather information about an after-school science enrichment program from the director, teachers, parents, and students. I looked at the initiative for the program, the work in preparing for it, the increase of student interest in science, and the suggested goals for improvement. Findings reveal a positive and appropriate enrichment program that might serve as a model for other programs.

The results of this study provide answers to the research questions posed in Chapter One: What happens when students in grades two through five participate in an after-school science enrichment program and how can teachers utilize programs to complement the curriculum of the classroom, increase academic achievement, and decrease problematic behavior? My conclusions suggest that the Evesham Township Saturday Enrichment Club held at Marlton Middle School is a place for educators and parents to work together to enhance students' education. The program provides a safe environment for students and the opportunity for students to develop socially and academically by engaging in age-appropriate science activities. The program also includes ways for parents to become involved in their children's science learning.

Conclusions from past studies on after-school programs were supported in my observations and responses from the participants. As Dryfoos (1999) indicated, there are

several concerns with programs which were revealed in my study: governance, space, program quality, funding, and accountability. The program was governed by the Superintendent's Advisory Council, which approved decisions; however, was not involved in formal evaluations of the program. As for space, it is essential factor in implementing after-school programs and in this case, they had many classrooms yet students were limited because of the small number of teachers. The programs were established based on the syllabi created by teachers and approved by the Superintendent's Advisory Council, so they were of high quality. For this particular program, funding was not an issue, because the parents paid a registration fee which covered all costs. Teachers were accountable for their individual programs and reported to the director if there were any contingencies. Providing the program with trained staff members becomes costly and difficult as Fashola (1998) indicated. The director of the program informed that teachers were difficult to recruit due to the day of the week and the compensation was not enough. The Saturday Enrichment Program at Marlton Middle School was able to involve the parents of its participants at the end of the program. Boileau (2003) found this factor essential to implementing after-school programs and continuing education beyond the school day. I also found this imperative to my study with the parents' commitment to their children's education and performing the activities at home as well.

### Limitations

Due to time constraints of the study, I was not able to interview as many candidates as I would have liked. The program was only eight weeks long and in an attempt to gather as much data as I could in different areas, I was not able to conduct a complex study in any of the areas. Having further time, I would have liked to survey the

teachers in the district that are not involved in the program to get a perspective from the outside. I would have also liked to interview with the educators involved with the Superintendent's Advisory Council to learn more about the program's operations and their criteria for approving decisions. Even the candidates I did conduct interviews with, I would have liked to ask more questions about their feelings of after-school programs. Without having the permission from the Superintendent, I was not able to take pictures or videotape the classes. This would have provided me with more time to analyze what was occurring throughout the sessions.

I would have liked to conduct a more elaborate study of the program by spending more time over several years there. A more in-depth analysis could be done by investigating a particular program across time. Since I was only conducting my research study on one program, I am not able to generalize my conclusions. Further, it is difficult to compare one program to another because they are all so different.

### Implications

In providing an investigation of one particular after-school enrichment program, my study adds to the research of after-school programs. I have found that a program works which contains a supervisory council, a director, qualified staff, involved parents, interested students, space and materials, enjoyable age-appropriate activities, all in a safe environment with the necessary financial support. The teachers feel they were successful in enhancing the students' education, the parents feel as though their children were involved in educational activities outside of school, and the students feel they were able to learn new concepts in a fun and interesting manner. The director and the teachers have also acknowledged the successes and the areas in need of improvement for next year.



Operating after-school programs is a process and steps must be taken each year to work towards advancing the program and continuing the trend of increasing its participants.

### Recommendations

In order for teachers to fully understand the operation of the program and how it helps students in the academic field, they must become involved with it. My findings suggest that the Superintendent's Advisory Council should become involved with the recruitment of teachers. If the Council expressed greater interest about the program to district faculty, perhaps teachers would more fully realize its importance. Otherwise, the director must put forth greater efforts in her recruitment other than simply posting a memorandum alongside the other flyers in the teacher lounge or office. Another recommendation is for the program to run for a longer period of time. I understand the district provides other activities for the students to do after-school; however, this is the only Saturday program offered. Even if there was just another eight week session in the school year, it would allow for more participants to get involved and establish greater visibility within the district. Evesham Township is a large district and I feel as though more people in the school could benefit by the program. The other issue with the program is the funding now that it is beginning to accumulate a budget. Instead of the money going back into the school district, the program should maintain its own account for more supplies, necessary scholarships, or higher teacher salaries. These recommendations are simply suggestions based on the research I found regarding the operation of the program and a more thorough investigation across a period of time could aid in implementing and providing more evidence to these conclusions.

### Suggestions for Further Research

This study also reveals the need for further research in the area of after-school enrichment programs. By looking closely at one particular program, I collected much data regarding the program's operation and its components. This contributed to the knowledge of the implementation of after-school programs. Characteristics of exemplary programs were portrayed in this study; however, there is a pressing need for more research in this area. Reasons for teachers' unwillingness to participate in the program would definitely be an area worth looking at further. The Superintendent's Advisory Council could also play a greater role in the implementation of the program. A closer look at the participants would have also been relevant to the study. Who participates in the program and why? Who does not participate in the program and why not? Finally, in regards to the research of after-school programs in general, it would be difficult to compare programs across districts. The best suggestion is for each district to set up a council for the sole purpose of evaluating their after-school programs and studying the effects in order to make improvements.

### Summary

In conclusion, in examining the views and opinions of the director, teachers, parents, and students regarding the operation of the Saturday Enrichment Program at Marlton Middle School, this study suggests the need for a more thorough investigation of participation. I found that the program contains the characteristics of successful after-school programs: a supervising council, a convenient location, finances, and approved quality syllabi. The program portrays after-school in a positive way and the appropriateness of the activities could serve as a model for other programs. Results of

further research might have significant implications for other after-school programs and after-school program could successfully be implemented in all districts. While more research may support my findings and the current research on the effects of after-school programs, it may also find negative effects and lack of commitment. Nonetheless, any research would certainly provide a broader perspective of after-school programs and more examples of successes. Teachers, including myself, can gain an understanding of how the programs work and what could result in connecting them to the school day. Ultimately, any future research will assist the development of after-school programs and advance our understanding as educators in the topic.

## References

- Beachum-Bilby, S., Seymour, L., & Krajewski, F. (1998, June-October). Making after school count. *Charles Stewart Mott Foundation*, 1 (1-2), 3-47. (ERIC Document Reproduction Service No. ED 427857)
- Boileau, P. L. (2003, August). Family night out: an after school program. *ERIC Clearing House on Elementary and Early Childhood Education*. (ERIC Document Reproduction Service No. ED 479351)
- Caplan, J. & Calfee, C. S. (1999). Comprehensive program planning for the integration of 21<sup>st</sup> century learning center after-school programs with regular day programs and community partners. *North Central Regional Educational Lab*. (ERIC Document Reproduction Service No. ED 439507)
- Cochran-Smith, M. & Lytle, S. L. (1993). *Inside outside teacher research and knowledge*. New York: Teachers College Press.
- Dessoff, A. (2006, May). After-school activity boosts learning. *District Administration*, 26.
- Dryfoos, J.G. (1999, Autumn). The role of the school in children's out-of-school time. *The Future of Children*, 9(2), 117-134. Retrieved September 29, 2006, from JSTOR.
- Farmer-Hinton, R. L. (2002, February). When time matters: examining the impact and distribution of extra instructional time. (ERIC Document Reproduction Service No. ED 479926)
- Fashola, O. S. (1998, October). Review of extended-day and after-school programs and their effectiveness. *Center for Research on the Education of Students Placed At Risk*. (ERIC Document Reproduction Service No. ED 424343)
- Ferreira, M. (2002, April). Ameliorating equity in science, mathematics, and engineering: a case study of an after-school science program. *Equity & Excellence in Education*, 35(1), 43-49.
- Fox, J. A., & Newman, S. A. (1997). After-school crime or after-school programs: tuning into the prime time for violent juvenile crime and implications for national policy. *Report to the US Attorney General: Fight Crime Invest in Kids*. (ERIC Document Reproduction Service No. ED 412319)
- James-Burdumy, S., Dynarski, M., Moore, M., Deke, J. Mansfield, W., & Pistorino, C. (2005, April). When schools stay open late: the national evaluation of the 21<sup>st</sup> century community learning centers program: final report. *US Department of Education, Institute of Education Sciences: National Center for Education*

*Evaluation and Regional Assistance.* (ERIC Document Reproduction Service No. ED 485162)

Knowlton, R. (2006). School based youth services. *New Jersey Department of Human Services*. Retrieved December 2, 2006, from New Jersey Department of Human Services Online. <http://www.state.nj.us/humanservices/sp&i/schoolbased.html>

McNulty-Braun, C. (2007). George Santayana: Quotes. Retrieved December 2, 2006, from *The Santayana Edition Online*. <http://www.iupui.edu/~santedit/index.html>

Schwarz, E., & Kay, K. (2006, Summer). Issue editors' notes. *New Directions for Youth Development*, 110, 1-7. Retrieved September 29, 2006, from Wiley InterScience Online.

Shumow, L. (2001). Academic effects of after-school programs. *ERIC Clearing House on Elementary and Early Childhood Education*. (ERIC Document Reproduction Service No. ED 458010)

United States Census Bureau 2000. (2007, January). Geographic area: Evesham Township, Burlington County, New Jersey. Retrieved January 20, 2007, from <http://factfinder.census.gov>

## Appendices

Appendix A

**Saturday Enrichment Club  
Teacher Application**

Teacher's Name: \_\_\_\_\_ School: \_\_\_\_\_

Home Address: \_\_\_\_\_ Phone #: \_\_\_\_\_

\_\_\_\_\_

Club Name: \_\_\_\_\_

Please check one: \_\_\_\_\_ new club      \_\_\_\_\_ existing club

This club meets the criteria for:      \_\_\_\_\_ Tier II      \_\_\_\_\_ Tier III

Description: (if new club)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_ I would like to develop and submit a syllabus for a new club. If approved, I understand I will be compensated for up to 10 hours at the contracted daily rate of \$27.23 to develop a syllabus.

I am applying to teach the following sessions from January 20<sup>th</sup> – March 17<sup>th</sup>:

\_\_\_\_\_ 9:00 am – 10:30 am

\_\_\_\_\_ 10:45 am – 12:15 pm

I understand I will be compensated at the contracted club rate of \$20.66.

Please return form to Debbie Iepson, Vice Principal, DeMasi Middle School or fax to me at 596-1571

Application Deadline: December 8, 2006

Notification Deadline: December 18, 2006

Appendix B

**Saturday Enrichment Club Registration**

Name: \_\_\_\_\_ School: \_\_\_\_\_

Address: \_\_\_\_\_ Grade: \_\_\_\_\_

Phone #: \_\_\_\_\_ Emergency Phone #: \_\_\_\_\_

Amount Enclosed: \_\_\_\_\_ \$80.00 (one session) \_\_\_\_\_ \$150.00 (two sessions)

Clubs will meet at Marlton Middle School on the following Saturdays: January 20<sup>th</sup>, January 27<sup>th</sup>, February 3<sup>rd</sup>, February 10<sup>th</sup>, February 24<sup>th</sup>, March 3<sup>rd</sup>, March 10<sup>th</sup>, March 17<sup>th</sup>. The first session will be held from 9:00 am – 10:30 am and the second session will be held from 10:45 am – 12:15 pm. Please check the club(s) and session(s) for which your child is registering. Choose only one club per session. The fee for one club is \$80.00 and the fee for two clubs is \$150.00. Transportation will NOT be provided.

Session I: 9:00 am – 10:30 am

\_\_\_\_\_ Cooking around the World \_\_\_\_\_ Theatre \_\_\_\_\_ The Scientist as a Detective

Session II: 10:30 am – 12:15 pm

\_\_\_\_\_ Cooking around the World \_\_\_\_\_ Theatre \_\_\_\_\_ The Scientist as a Detective

\*Individual sessions will be held with a minimum of 10 students and a maximum of 20. You will receive a phone call prior to the first day of classes.

\*\*Please indicate any important medical conditions (i.e. severe allergies) that may be relevant.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Cooking around the World – Gain an understanding and respect of many different ethnic groups in our world. Prepare, cook, and taste different foods from other countries around the world.

The Scientist as a Detective – Prepare and perform experiments, investigate bacterial growth, learn about animal behavior and prepare your own slides to view under the microscope. Learn the Scientific Method! Come with your questions and curiosity!

Theatre Club – This year’s program will be “A Collection of Fairytales.” Learn your lines, sing new songs, and perform a simple dance while meeting new friends. Final performance on the last day for family and friends!



Appendix C

**Permission Form**

Dear Parent/Guardian,

I am a graduate student in the Collaborative Education (Co-Teach) Department @ Rowan University. I will be conducting a research project under the supervision of Dr. Midge Madden as part of my masters' thesis concerning the effects of an enrichment program. I am requesting yours and your child's participation in this study. The purpose of the interviews in this study is to provide an elaborate perspective on the effectiveness of an eight-week enrichment program.

I will be asking you and your child a few questions pertaining to their view of science and of the program in general. I will also be interviewing the staff involved in the program in order to obtain a perspective on all aspects of the program. These interviews will be conducted in focus groups and your child's name will not be used in the study. Please see the attached questions that will be asked of all participants in the study. All participation in this interview is strictly voluntary and responses will be kept anonymous and confidential. No response is necessary and participation will not affect any child's performance in the program. For further information regarding this study, please contact the principal investigator, Jennifer Jamison, @ (609) 313-5091 or the faculty sponsor, Dr. Madden, @ (856) 256-4500 ext. 3834. Also, you may contact the director of the program, Deborah Iepson @ (856) 988-0777 ext. 2721 as she is full aware of all research taking place. Thank you.

Sincerely,

Jennifer Jamison

---

Please indicate whether or not you wish to participate in this interview and have your child participate by checking the appropriate statement below and returning this with your child to the program. Everyone involved is aware of this study and can forward the slips to me. Please try to return the slips by the second week of the program.

\_\_\_\_\_ I grant permission for my child \_\_\_\_\_ to participate in this study.

\_\_\_\_\_ I do not grant permission for my child \_\_\_\_\_ to participate in this study.

\_\_\_\_\_  
Parent Signature

\_\_\_\_\_  
Date

## Appendix D

### Sample Lesson on Liquids

Purpose: Learning about Liquids and Surface Tension.

Objective: Children are to learn about the properties of a liquid, experiment with liquids to find out which liquids are lighter and less dense than others and to observe surface tension and how to reduce it.

Introduction: After discussion of liquids and their properties children are to:

- pour three liquids into a cup and to observe how the three liquids form three layers
- float a needle on water
- float a cardboard boat in water with liquid detergent

Development:

Questions to be answered:

- What was the arrangement of the three liquids in the cup?
- Why did this arrangement happen?
- What happened to the needle in the water?
- Why did this happen?
- What happened to the boat in the water?
- Why did this happen?

Materials: alcohol-10cc, water-10cc, oil-10cc, plastic cup, sewing needle, cardboard boat, dish detergent, toothpick, small tub

Procedures:

1. Carefully pour the following liquids into a plastic cup:  
10cc alcohol, 10cc water, 10cc oil  
Observe how the three liquids form in the cup. Why did this happen?
2. Pour water into a cup. Lay a sewing needle on the surface of the water using dry fingers. The needle should have floated. Do you know why?
3. Make a boat out of cardboard. Fill a small tub with water and some liquid detergent. The boat should have moved quickly forward. Do you know why?

Closure: Children are to orally explain what they did and what happened.

Assessment/Evaluation: Fill out lab reports.

Appendix E



Name \_\_\_\_\_

**Sample Lab Report**

---

Purpose of this experiment

---

Materials that I used

---

Hypothesis I investigated

---

Procedure that I followed

---

Conclusion/Explanation that the experiment demonstrated

---