

The Effect of Archery Experiential Learning Program on Children 's Communication and Peer Relationship

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Abstract

In modern society, the optimal physical environment is constantly changing due to IT development, and it is provided with convenience. In this age environment, the children are growing up thinking that the value of community consciousness through relationship with others is not important in the social reality in which various ways and environments that can be done by themselves are succeeding. No matter how rapidly the world changes, a diverse learning environment is needed that establishes desirable human relationships and recognizes community consciousness and values.

The purpose of this study was to investigate the effects of general children(elementary school 4th, 5th, and 6th graders) on the communication and peer relationship of the children participating in the archery experiential learning program, to emphasize the importance of physical activity programs, and also by analyzing the relationship between communication and improvement of peer relationship and to understand the effect of the archery experiential training learning which is one of exercise program. In order to verify the research problems, 30 experimental group and 30 comparative group were composed of 4th, 5th, and 6th grade elementary schools in Gwangsan-gu, Gwangju metropolitan city. The experiment group was participated in the archery experiential learning program for a total of 10 sessions, once a week for 60 minutes, and conducted a questionnaire survey.

In this study, we examined the effect of archery experiential learning program on improving children 's communication and peer relationship ability. Thus, it showed that archery experiential learning program can be one of the important educational methods to promote the healthy character and development of children.

▶Keyword: Community Consciousness, Archery Experience Learning, Communication, Peer Relationship

I . Introduction

1. Necessity of Research

While children have a variety of methods and policies to ensure that they are physically and mentally sound and regularly nurtured, modern society is constantly experiencing new problems with children. In addition, changes in values and changes in nature and social environment have given rise to severe national crises

such as low fertility and aging. In this age, we must all worry about ways of self-realization through the balance of children's work and life, satisfaction of life, and social relations.

As children become 'de-self centered' through participation in physical activity during their growth, they

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become rich social relationships and have a cooperative and competitive relationship with their friends who work together. In addition, children respect the opinions of others and learn social norms such as rule compliance, etiquette, cooperation, competition, sportsmanship, and internalize them, and sociality such as mutual cooperation with others, compliance, cooperation, sociability and independence will develop[1].

Recently, the appearance of various indoor sports has created an indoor archery that can be enjoyed by all ages, young and old. It is a very desirable phenomenon that the indoor archery is growing into a new concept sports culture through the fusion of new trend IT video technology. Archery is a good exercise for body training and mental training, and it is very effective for improving body shape, concentration and stress of growing children.

Children will learn how to balance their body and posture with the archery experiential learning program, concentrate their mind toward the bullseye, and have the ability to control their own body and achievement goal. And gain confidence.

The purpose of this study is to examine the effect of the archery experiential learning program on cooperative competitive relationship, respect for others' opinions, mutual cooperation with others, sociability and independence on communication and peer relations.

Children see their identity as determined by which group they belong to and who they get recognition from. Also, any group wants to belong to one stable peer group and wants to be recognized in the group[2].

According to Eckerman[3], "Peers have a role as important role models for each other. He observes, imitates, and internalizes the behavior of peers and makes them his own."

Communication is a way of interacting using language in interpersonal relationships, closely related to social context and understanding[4]. Communication is closely related to social acceptance and peer relations and is a basis for self-growth and social adjustment of adolescents.

In recent years, bullying has become a serious social phenomenon in the school scene, but it has pointed out that the bullying can not clearly express self-intention[5]. One of the personal risk factors that could affect school violence was aggressive and inappropriate language ability[6]. Communication skills

can be promoted more effectively through education and training[7]. In this context, it is necessary to improve the peer relations and the friendly interpersonal relationship by raising the educational and training opportunities for the children to communicate smoothly in the educational field.

As a result of this study, applying the archery experiential learning program which can improve children's communication and peer relationship as a systematic learning process can contribute to more positive thinking ability and desirable human relation formation than current education environment.

2. Purpose of Research

The purpose of this study was to investigate the effects of general children(elementary school 4th, 5th, and 6th graders) on the communication and peer relationship of the children participating in the archery experiential learning program, to emphasize the importance of physical activity programs, the purpose of this study is to analyze the relationship between communication and improvement of peer relationship and to understand the effect of exercise training learning which is one of exercise program.

3. Problem of Research

Based on the purpose and necessity of this study, the following problems were set up to carry out the archery experiential learning program to general children (elementary school 4th, 5th, and 6th graders) to verify the meaningful changes in children's communication and peer relations. Research Question 1: Does the experimental group and the comparative group experiencing the archery experiential learning program have a significant difference in communication ability and peer relationship formation ability? Research Question 2: Is there a correlation between the children's communication ability and peer relationship formation ability? Research Question 3: Does the communication of the study children affect peer relationships?

4. Limitations of Research

There are limitations and limitations in carrying out this study. First, because the sample was collected only for a part of general children (elementary school 4th, 5th, and 6th graders), it is rather difficult to generalize and interpret the research results because the

representation is not satisfied. Second, since the experimental design is a posttest-only control group design, it is possible to eliminate the effect of experiment intervention and test, save time and cost, but since there is no pre-test, there is a lack of a way to verify if it was a group.

II. Theoretical Background

1. Archery

Archery is a repetitive movement that requires strict consistency and affects the record, such as posture, concentration, power distribution, breath control, rhythm sense, equipment and psychological anxiety[8]. Archery, however, can not be distinguished by the nature of the technique. It should be recognized as a single action, and the score is determined by microscopic movements that are not visible[9].

Especially, it is the most important key operation in archery competition, and it can be said that the technique is performed in the backtension range from release to follow draw[10]. The backtension technique was "until the moment I pulled the arrow and put anchor under my chin and pulled the clicker to shoot." [9].

It is important that archery has the most suitable equipment for the individual. The strength of the bow can be adjusted to the strength of the force depending on the person who pulls it. The bow separates the body part and the wing part. Depending on the strength of the pulling arm, you can use the pound to assemble the body of your choice bow.

The strength of the bow used in this study was 14~18 pounds, adjusted to fit the body shape. The target was composed of 5 color concentric circles with a diameter of 80cm near the bow, and the length of the bow(archery line) was 7 meters.

2. Communication

Communication was defined as the exchange of emotions and meanings to see problems and differences from the point of view of others, including both verbal and nonverbal. Myers & Myers[11] further suggested that humans interact with each other through communication, conveying thoughts, feelings, attitudes,

thoughts, and developing personal relationships with others. Cooker & Cherchia[12] said that communicating forms a successful interpersonal relationship to meet social needs, which is the basis of self-realization. Opening oneself to others in order to understand others, and deviating from oneself is a positive influence on mental health and self-growth as well as promoting human relations[13].

In this study, communication was divided into open communication and dysfunctional communication. Open communication has the ability to freely express thoughts and feelings and to solve problems effectively. Dysfunctional communication uses negative, inconsistent messages and inconsistent dual messages and has poor problem solving skills.

3. Peer relationship

Ainsworth[14] analyzed the relationships between child attachment and peer interaction, and examined the characteristics of communication affecting attachment in childhood[15]. The results of this study suggest that the importance of peer relationships increases as childhood experiences psychological support, stability, and socialization through peer interaction.

In this study, the sub-factors of peer relations were composed of positive peer relations and negative peer relationships. Positive peer relationships consisted of mutual intimacy, emotional and social support, and peer relationship satisfaction. Negative peer relationship factors consisted of conflict, confrontation, unilateralism, withdrawal and isolation.

III. Research method

1. Research subjects

This study consisted of 30 experimental group and 30 comparative group in general children (elementary school 4th, 5th, 6th grade) in Gwangsan-gu, Gwangju Metropolitan City. The experiment group was participated in the archery experiential learning program for 10 sessions for 60 minutes once a week. The subjects of the study are listed in [Table 1].

Table 1. Study subjects and composition

| Experimental Group | | Comparison Group | | Experimental Group (graders) | | | Comparison Group (graders) | | |
|--------------------|--------|------------------|--------|------------------------------|-----|-----|----------------------------|-----|-----|
| male | female | male | female | 4th | 5th | 6th | 4th | 5th | 6th |
| 15 | 15 | 15 | 15 | 4 | 7 | 19 | 5 | 10 | 15 |

Table 2. Question and reliability of communication scale.

| Contents | Number of questions | Item number | Cronbach's α |
|---------------|---------------------|--|---------------------|
| Communication | 20 | 1*,2*,3*,4*,5,6,7,8,9,10, 11,12*,13*,14,15,16,17*,18*,19*,20* | .675 |

* Question Mark : Scoring opposite

Table 3. items and the reliability of the peer relationship measure

| Sub-factor | Number of questions | Item number | Cronbach's α |
|--------------------------------|---------------------|-------------------------|---------------------|
| Positive factor | 16 | | .867 |
| Mutual intimacy | 4 | 5,8,21,27 | .655 |
| Emotional and social support | 9 | 6,7,9,12,13,16,19,20,28 | .792 |
| Peer relationship satisfaction | 3 | 2,23,31 | .644 |
| Negative factor | 15 | | .851 |
| conflict | 5 | 3,11,15,17,26 | .761 |
| Unilaterally led | 6 | 1,4,14,18,22,24 | .604 |
| Withdrawal & Isolation | 4 | 10,25,29,30 | .694 |
| All | 31 | | .891 |

Negative factor question : Scoring opposite

2. Research design

The independent variable of this study is the archery experiential learning program and the dependent variable is communication ability and peer relationship formation ability. Experimental groups participating in archery experiential learning and comparative groups not participating in archery experiential learning were selected. For the experimental group, the experimental variables were processed. For the control group, the posttest-only control group design method was used after the experimental variables were not processed. The post-test was performed for both groups, and the effect of the experimental variables was compared between the observation value of the experimental group and the observation value of the comparative group.

3. Research tools

3.1 Communication

In order to measure the level of communication ability, we used the communication test tool produced by Han Jong-heoi(1996) based on Bames & Olson's(1982) parent-child communication measurement tool. The communication survey was measured by the Likert 5-point scale, consisting of 10 items of open communication, 10 items of dysfunctional communication, total 20 items. In this study, the internal consistency coefficient of communication (Cronbach 's α) is 0.675.

3.2 Peer relations

In order to measure the peer relationships, Yu An-jin·Han Yu-jin·Kim Jin-kyung(2002) based on the research of Parker and Asher(1993) used the peer relationship type scale which infer the factors reflecting the qualitative aspect of the peer relationship. In this study, we used the test tools of Kim Jae-eun(2007) which supplemented these items.

The peer relationship survey was measured by the Likert 5-point scale and consisted of 16 positive peer relationships and 15 negative peer relationships. Positive peer relationships are Mutual intimacy(4 items), Emotional and social support(9 items), and peer relationship satisfaction (3 items). Negative factors of peer relationships are conflict(5 items), Unilaterally led(6 items), Withdrawal & Isolation(4 items). Positive factors mean that the higher the score, the more positive it is. The more negative the score, the more negative it means. In this study, the internal consistency coefficient (Cronbach 's α) of the peer relationship is 0.867 in the positive, 0.851 in the negative, and 0.891 in the overall.

4. Data analysis

After the questionnaire was retrieved from the study subjects, unfair data such as one-sided entry, double entry, and no entry were deemed to be unreliable. The statistical program for the data processing of this study was SPSS 18.0, and the data were analyzed by the following statistical

Table 4. Communication skills of children according to group classification

| Group classification | Number of cases | Mean | SD | Degree of freedom | t-value |
|----------------------|-----------------|-------|------|-------------------|----------|
| Experimental Group | 30 | 73.03 | 6.50 | 58 | 5.368*** |
| Comparison Group | 30 | 63.80 | 6.81 | | |

*p < 0.05, **p < 0.01, ***p < 0.001

Table 5. Ability of children to form peer relations according to group classification

| Group classification | Number of cases | Mean | SD | Degree of freedom | t-value |
|----------------------|-----------------|--------|-------|-------------------|----------|
| Experimental Group | 30 | 124.70 | 10.83 | 58 | 7.989*** |
| Comparison Group | 30 | 101.70 | 11.47 | | |

*p < 0.05, **p < 0.01, ***p < 0.001

Table 6. Children's ability to form peer relationships by grouping sub-factors (Degree of freedom=58)

| Sub-factor | Group classification | Number of cases | Mean | SD | t-value |
|--------------------------------|----------------------|-----------------|-------|------|----------|
| Positive factor | Experimental Group | 30 | 62.07 | 8.61 | 5.723*** |
| | Comparison Group | 30 | 50.40 | 7.11 | |
| Mutual intimacy | Experimental Group | 30 | 13.93 | 3.14 | 3.645** |
| | Comparison Group | 30 | 11.27 | 2.49 | |
| Emotional and social support | Experimental Group | 30 | 34.33 | 5.18 | 5.262*** |
| | Comparison Group | 30 | 27.73 | 4.51 | |
| Peer relationship satisfaction | Experimental Group | 30 | 13.80 | 1.42 | 4.885*** |
| | Comparison Group | 30 | 11.40 | 2.28 | |
| Negative factor | Experimental Group | 30 | 62.63 | 5.66 | 6.009*** |
| | Comparison Group | 30 | 51.30 | 8.64 | |
| conflict | Experimental Group | 30 | 21.83 | 2.51 | 5.729*** |
| | Comparison Group | 30 | 17.13 | 3.73 | |
| Unilaterally led | Experimental Group | 30 | 23.33 | 3.19 | 3.200** |
| | Comparison Group | 30 | 20.53 | 3.58 | |
| Withdrawal & Isolation | Experimental Group | 30 | 17.47 | 1.93 | 5.859*** |
| | Comparison Group | 30 | 13.63 | 3.02 | |

*p < 0.05, **p < 0.01, ***p < 0.001

method according to the research hypothesis. Statistical significance was set at $p < 0.05$. First, Cronbach 's a coefficient was calculated to verify the reliability of measurement tools. Second, independent samples t-test was conducted on the subjects' communication ability and peer relationship forming ability. Third, independent samples t-test was conducted by dividing the sub-factors of peer relationship forming ability of the study children into experimental group and comparative group. Fourth, we investigate whether there is a correlation between the children's communication and the peer relationship variables, investigate the degree of correlation, and predict how the other variables change when one variable changes. Correlation analysis was performed. Fifth, correlation analysis was performed to investigate the degree of correlation between sub-factors (positive and negative factors). Sixth, simple regression analysis was conducted to investigate the effect of communication ability of children on peer relations. Seventh, multiple regression analysis was carried out to investigate the effect of functional communication ability and dysfunctional drowning communication ability on peer relationship formation ability.

IV. Research results

1. Comparison of communication and peer relations according to participation in archery experiential learning program

[Table 4], [Table 5] shows the results of testing the difference in communication ability and peer relationship forming ability between the experiment group participating in the archery experiential learning program and the non-participating comparison group.

In the communication score, the mean of the experimental group children was 73.03(SD=6.50) and the average of the comparison group children was 63.80(SD=6.81). This difference was statistically significant at the t value of 5.368, with the null hypothesis rejected at the level of $p < 0.001$. Therefore, the communication scores of the two groups differ according to participation, and the children who participated in the archery experiential learning program were higher than those who did not participate in the archery experiential learning program.

In the peer relationship score, the average of the experimental group children was 124.70(SD=10.83) and the average of the comparison group children was 101.70(SD=11.47). This difference was statistically

Table 7. Correlation between communication and peer relationship formation ability

| Group classification | Variable | Communication | Peer relationship |
|----------------------|-------------------|---------------|-------------------|
| All Group | Communication | | .701*** |
| | Peer relationship | .701*** | |
| Experimental Group | Communication | | .476** |
| | Peer relationship | .476** | |
| Comparison Group | Communication | | .530** |
| | Peer relationship | .530** | |

*p < 0.05, **p < 0.01, ***p < 0.001

Table 8. Correlation between sub-factors of peer relationship forming ability

| Sub-factor | Mutual intimacy | Emotional and social support | Peer relationship satisfaction | conflict | Unilaterally led |
|--------------------------------|-----------------|------------------------------|--------------------------------|----------|------------------|
| Emotional and social support | .710*** | | | | |
| Peer relationship satisfaction | .460*** | .555*** | | | |
| conflict | .302* | .379** | .554*** | | |
| Unilaterally led | .092 | .158 | .351** | .576*** | |
| Withdrawal & Isolation | .248 | .363** | .571*** | .632*** | .602*** |

*p < 0.05, **p < 0.01, ***p < 0.001

significant at the t value of 7.989, with the null hypothesis rejected at the level of $p < 0.001$. Therefore, the peer relationship formation ability of the two groups differ according to their participation, and the children who participated in the archery experiential learning program were higher than the children who did not participate in the archery experiential learning program.

The results of testing the differences between the experimental group participating in the archery experiential learning program and the non-participating comparative group on the sub-factors(positive factors and negative factors) of peer relationship formation ability are shown in [Table 6].

In the positive factor, which is a sub-factor of peer relationship forming ability, the average of the experimental group children was 62.07(SD=8.61), which was higher than the average 50.40(SD=7.11) in the comparison group children. In the negative factor, which is a sub-factor of peer relationship forming ability, the average of the experimental group children was 62.63(SD=5.66), which was higher than the average 51.30(SD=8.64) in the comparison group children. This difference was statistically significant at the $p < 0.01$ level for all items of the sub-factors, with the null hypothesis rejected. Therefore, the sub-factors of peer relationship formation ability of the two groups differ according to participation, and the experimental group children are higher than the comparative group children.

2. Correlation between communication and peer relations according to participation in archery experiential learning program

The relationship between communication ability and peer

relationship formation ability of experimental group and comparison group children was examined, and correlation analysis was performed to measure the relationship between communication ability and peer relationship formation ability. The results are shown in [Table 7].

The correlation coefficient between the communication ability and the peer relationship forming ability of the whole child was 0.701($p < 0.001$), the correlation coefficient between the communication ability and the peer relationship forming ability of the experimental group was 0.476($p < 0.01$), the correlation coefficient between the communication ability and the peer relationship forming ability of the comparison group was 0.530($p < 0.01$), which showed statistically significant correlation. In conclusion, regardless of experiment, the higher the communication ability, the higher the ability to form peer relationships.

In addition, correlation analysis was conducted to determine whether there is a correlation between sub-factors of children's peer relationship forming ability. The results are shown in [Table 8].

The relationship between the children's peer relationship formation ability and the sub-factors was analyzed. For the positive factors, correlation coefficient between mutual intimacy and emotional and social support was 0.710($p < 0.001$), correlation between mutual intimacy and peer relationship satisfaction was 0.460($p < 0.001$), peer relationship satisfaction and emotional and social support correlation coefficient was 0.555($p < 0.001$) respectively. In the case of negative factors, conflict and unilaterally led correlation coefficient were 0.576($p < 0.001$), conflict and Withdrawal

Table 9. Communication Effects on Peer Relationships

| Independent variable | B | β | t | P |
|---|-----------|---------|-------|------|
| Communication | 1.390 | .701 | 3.304 | .003 |
| a constant | 18.067*** | | | |
| R ² (coefficient of determination) | .255 | | | |
| F | 56.132*** | | | |

*p < 0.05, **p < 0.01, ***p < 0.001

Table 10. Effects of functional and dysfunctional communication on peer relations

| Independent variable | B | β | t | P |
|--|-----------|---------|-------|------|
| Functional communication | .957 | .213 | 2.144 | .036 |
| Dysfunctional communication | 1.584 | .608 | 6.119 | .000 |
| a constant | 66.885* | | | |
| R ² _{adj} (coefficient of determination) | .484 | | | |
| F | 28.707*** | | | |

*p < 0.05, **p < 0.01, ***p < 0.001

& Isolation correlation coefficient was 0.632 (p < 0.001), and Withdrawal & Isolation and Unilaterally led correlation coefficient were 0.602 (p < 0.001) appear.

In conclusion, one factor influences the other factors between the positive and negative factors of sub-factors of peer relationship formation ability.

3. Effects of communication on peer relationships

A simple regression analysis was conducted to analyze the effect of communication of all children on peer relationships. The results are shown in [Table 9].

From the results of the simple regression analysis, we can estimate the communication and peer relations by the regression equation using the non-standardized regression coefficient(B).

$$\text{Peer relationship} = 18.067 + 1.39(\text{communication}).$$

As a result of simple regression analysis, communication ability positively affects peer relationship formation ability and has about 25.5% explanatory power. In addition, it can be seen that peer relationship is increased by 1.39 points when communication is increased by 1 point.

Next, multiple regression analysis was conducted to analyze the effect of functional communication and dysfunctional communication on the peer relationships of all children under study. The results are shown in [Table 10].

From multiple regression analysis results, multiple regression equation is estimated by non-standardized regression coefficient(B).

$$\text{Peer relationship} = 66.885 + 0.957 (\text{func. communication}) + 1.584(\text{dysfunc. communication})$$

Functional communication (t=2.144, p=0.036) and dysfunctional communication (t=6.119, p=0.000) were statistically significant. The children with high functional

communication and dysfunctional communication have higher peer relationship formation ability. As a result of multiple regression analysis, functional communication and dysfunctional communication positively influence peer relationship and have about 48.4% explanatory power. Also, when one point of functional communication and dysfunctional communication is increased by one point, it can be seen that the peer relationship increases by 2.541 points.

V. Conclusion

In order to maintain a good relationship, positive attitudes toward oneself and others are important, but the behavior and expression of each other is also very important. Therefore, we must acquire the various methods and techniques necessary to increase the ability of human relations, and educate and train them so that they can be utilized in actual interpersonal situations. The child's communication ability and peer relationship formation ability are closely related and have an important influence on the child's self-growth and socialization ability.

The purpose of this study was to investigate the effect of children on communication and peer relations by participating in the archery experiential learning program for general children (elementary school 4th, 5th, and 6th graders), analyzing the relationship between communication and peer relationship improvement as a result of the study, we found out the effect of archery experiential learning as one of the exercise participation programs.

The SPSS 18.0 was used as the statistical program for the data processing of this study, and independent samples t-test was conducted on the subjects' communication ability and peer relationship formation ability. In addition, we investigate whether there is a correlation between children's communication and peer relationship variables, investigate the degree of correlation, predict how the other variables change when one variable changes, Correlation analysis. And simple regression analysis and multiple regression analysis were performed to investigate the effect of communication ability of children on the peer relationship.

The results of this study are as follows.

First, as a result of examining the difference of communication ability and peer relationship forming ability between the experiment group participating in the archery experiential learning program and the non-participating comparative group, the communication scores of the two groups differ according to participation, were higher than the children in the comparison group. Second, the sub-factors of peer relationship formation ability differed between the experimental group and the comparative group, and the children who participated in the archery experiential learning program were higher than those who did not participate in the archery experiential learning program. Third, correlation analysis was conducted to determine whether there is a correlation between communication ability and peer relationship formation ability of experimental group and comparison group students. As a result, all of them showed a statistically significant correlation, and regardless of the experiment, the higher the communication ability, the higher the peer relationship formation ability. Fourth, correlation analysis was conducted to determine whether there is a correlation between the sub-factors of peer relationship formation ability of the study children and to measure the degree of relationship. The results are statistically significant. One factor influences the other factors between the positive and negative factors of the sub-factors of peer relationship formation ability. Fifth, the results of the simple regression analysis to examine the effect of communication and peer relationship of all children in the study positively influence peer relations and have about 25.5% of explanatory power. In addition, it was found that peer relationship increased by 1.39

points when communication increased by one point. Sixth, multiple regression analysis was conducted to investigate the effect of functional communication and dysfunctional communication on the peer relationship of all children under study. The results showed that children with high functional communication and dysfunctional communication were found to have high peer relationship formation ability. In addition, functional communication and dysfunctional communication have a positive effect on peer relationship and have about 48.4% explanatory power. And that the peer relationship increased by 2.54 points when functional communication and dysfunctional communication increased by 1 point, respectively.

As a result of this study, applying the archery experiential learning program which can improve children's communication and peer relationship as a systematic learning process will contribute to forming more positive thinking ability and desirable human relationship than current educational environment. As a result, children who communicate effectively become more receptive to peers and better fit with their peers. Communication is essential for interaction with others, and effective communication skills can improve positive relationships. Therefore, if various experiential learning programs, such as archery experiential learning programs, are organized in the child education curriculum, it will be very helpful for the positive thinking of the child and the formation of desirable human relations.

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