The Effect of Self-analysis on Archery Performance Among Undergraduate Students

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ABSTRACT

The purpose of the study was to examine the effect of self-analysis on archery performance. Pre-Professional physical education students were randomly assigned in two groups (control & treatment). Pre and Post-test scores consisted of the total points for six arrows shot at ten feet. Repeated measure scores were collected from performances during instruction. The control group received peer feedback on their performance; the treatment group received feedback through video observation of their performance and completion of self-analysis checklist. All students received the same instruction in nine 90-minute instructional sessions, according to the National Archery Association. By comparing the mean differences of the pre-test and post-test scores of the control group (Mean = 13.58) and experimental group (Mean = 13.31), there was an increase by both groups in their ten-ring scores. A substantial decrease in the standard deviations from pre-test to post-test for both groups, suggests tighter arrow groupings. The results of an ANCOVA, yielded no significant difference between the control group and the experimental group $F (1, 22) =.213$ where $p (>.05) =.649$. The conclusion was no significant difference in ten-ring scores between the uses of video assisted self-analysis or peer feedback analysis.

INTRODUCTION

Archery is growing throughout school districts as a part of the physical education curriculum in America. The Kentucky Department of Education (2002), Archery Standards-Based Unit of Study is just one of a few elaborate archery curriculums that are beginning to develop across the United States. As future physical educators, the effect of developing a class that involves active guided discovery learning is essential in the success of becoming competent shooters.

The problem beginning archers face is the understanding of what perfect form when shooting consists of. The National Archery Association has established "9 Steps to the 10-Ring" (2003, 4th Ed). The 10-ring is referring to shooting at a ten-ringed target with the center bullseye being a ten. Over the course of this project, we hoped to determine whether video-assisted self-analysis with a checklist, using pre and post-test measures would improve shooters performance and form.

Video analysis can be used for several activities that are presented in physical education curriculums. Such activities may include the tennis serve, a basketball free throw, and several different track and field events. Applying different angles of the camera gives the students good visuals of all the aspects of the nine steps to shooting. Donald Hume has applied video analysis to the tennis serve where he has said that using a checklist in conjunction with video tape is key in identifying the components of the tennis serve. This concept will be applied to the archery shot in this project.

The purpose of this project was to examine the effect of self-video analysis on archery performance in a classroom setting. We created a treatment and control design with Pre and Post-test measures with repeated measures collected during treatment. The data was collected through the students' self-analysis using a checklist. See Appendix A. We proposed a significant increase in shooting scores from the control group to the treatment group by analyzing the students Pre and Post-test measures with repeated measures collected during treatment.

METHODS

The subjects of this project included students enrolled in ESS 367 (Individual Sports) in the Spring of 2004. These students were randomly assigned in two groups based on the last four digits of their ID number. These two groups were then randomly selected as a treatment and a control group throughout the study. The study involved a Pre and Post-test design. Pre-test scores consisted of the total points for six arrows shot at ten feet according to the National Archery Association (NAA). Post-test scores consisted of the total points for six arrows shot at ten yards according to the NAA. Repeated measure scores were collected from performances during instruction. These scores consisted of the arrow scores shot during class and were associated with the skill analysis score for each student from the self-checklist. These scores were then analyzed using a t-test or the appropriate statistical check to display initial differences between the treatment and control group. The control group received peer feedback on their performance using the checklist; the treatment group received feedback through observation of their performance immediately after shooting by completing their self-analysis checklist while watching video of themselves. All students received the same instruction according to the NAA and will participate in nine 90-minute instructional sessions. Both the control and treatment group will have a visual of the "9 Steps to the 10-Ring" posted near their station when shooting.

The videotape will consist of a view of four shooters at a time and we will be looking at right-handed shooters only. After every two 90-minute sessions, the lines of groups will rotate so the treatment group shooters will all have the same amount of viewing from different distances throughout the study.

PROCEDURE

We created a treatment and control design with Pre and Post test measures with repeated measures collected during treatment.
   a. Subject: Students who were enrolled in ESS 367 (Individual Sports) in the Spring and Fall of 2004. Students were randomly assigned in two groups based on last four digits of ID number. These two groups will be randomly selected as a treatment and a control group.
   b. Design: The study involved a Pre and Post-test design. Pre-test scores consisted of the total points for six arrows shot at ten feet according to the National Archery Association (NAA). Post-test scores consisted of the total points for six arrows shot at ten feet according to the NAA. Repeated measure scores were collected from performances during instruction. Scores consisted of the arrow scores associated with the skill analysis score for each arrow shot during practice.
   c. Treatment: The control group received peer feedback on their performance; the treatment group received feedback through observation of their performance immediately after shooting by completing their self-analysis checklist. All students received the same instruction according to the NAA and participated in nine 90-minute instructional sessions. Our data collection will be based off the self-analysis checklist as an entire group.

RESULTS

The purpose of the research was to determine whether video self-analysis in archery has an affect on students' ten-ring score through pre and post-testing with repeated measures. Once the pre and post-testing was completed, ANCOVA (analysis of covariance) was used to determine if the null hypothesis was significant. The null hypothesis was tested that there is significance in ten-ring scores from pre to post-test shooting.

Through the use of ANCOVA, it was determined that there was no significant difference between the control group and the experimental group on the basis that $F (1, 22) = .213$ where $p (>.05) = .649$. Therefore it was determined that there was no significance between the control and experimental groups in their ten-ring scores from pre-testing to post-testing by the use of video self-analysis.

By looking at the mean scores of the control group and experimental group from pre-test to post-test, there was a significant increase by both groups in their ten-ring scores. There was also a significant drop in the standard deviation from pre-test and post-test for both the control group and the experimental group.

DISCUSSION

The results showed that there was no significant difference in archery performance when using video analysis. Further research could be the exploration of a larger sample population and the use of a smaller class size in general so the emphasis would be focused more towards quality review of the videotape. The use of a variety of camera angles may also be explored in future research.

ACKNOWLEDGEMENTS

REFERENCES

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National Archery Association, www.usarchery.org
National Field Archery Association, www.nfaa-archery.org

APPENDIX

ARCHERY CHECKLIST

TRIAL #1   Arrow Score

9 - STEPS	Arrow #1	Arrow #2	Arrow #3	Arrow #4	Arrow #5	Arrow #6
	Inefficient (0) / Efficient (1)	Inefficient (0) / Efficient (1)	Inefficient (0) / Efficient (1)	Inefficient (0) / Efficient (1)	Inefficient (0) / Efficient (1)	Inefficient (0) / Efficient (1)
1 STANCE	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
2 NOCK	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
3 SET	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
4 PRE-DRAW	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
5 DRAW	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
6 ANCHOR	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
7 AIM	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
8 RELEASE	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
9 FOLLOW-THROUGH	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1

TRIAL #2   Arrow Score

9 - STEPS	Arrow #1	Arrow #2	Arrow #3	Arrow #4	Arrow #5	Arrow #6
	Inefficient (0) / Efficient (1)	Inefficient (0) / Efficient (1)	Inefficient (0) / Efficient (1)	Inefficient (0) / Efficient (1)	Inefficient (0) / Efficient (1)	Inefficient (0) / Efficient (1)
1 STANCE	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
2 NOCK	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
3 SET	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
4 PRE-DRAW	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
5 DRAW	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
6 ANCHOR	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
7 AIM	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
8 RELEASE	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
9 FOLLOW-THROUGH	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1

TRIAL #3   Arrow Score

9 - STEPS	Arrow #1	Arrow #2	Arrow #3	Arrow #4	Arrow #5	Arrow #6
	Inefficient (0) / Efficient (1)	Inefficient (0) / Efficient (1)	Inefficient (0) / Efficient (1)	Inefficient (0) / Efficient (1)	Inefficient (0) / Efficient (1)	Inefficient (0) / Efficient (1)
1 STANCE	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
2 NOCK	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
3 SET	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
4 PRE-DRAW	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
5 DRAW	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
6 ANCHOR	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
7 AIM	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
8 RELEASE	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1
9 FOLLOW-THROUGH	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1	0 / 1