

The Effect of Training With Feedback and Speed on The Performance of Cross Country (XC) Mountain Bike Racing Athletes

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Abstract: The aim of this study was to determine the effect of knowledge of performance and speed feedback on the mountain bike racing training program to improve performance in uphill techniques. The population in this study were all beginner athletes racing number xc mountain bikes in Karawang district. By using a purposive sampling technique, 20 samples were selected with a non-mountain bike racer background, which was then used to collect data using a stopwatch instrument. Processing and analyzing the data using SPSS 16. In this study the calculation technique used the One-Way Anova test. The research hypothesis is that there is a positive effect of giving feedback on improving the performance of mountain bike racers and there is a difference in the effect of feedback on low-speed athletes and there is no difference in the effect of feedback on high-speed athletes. The results of this study show differences in the increase in time between groups of high-speed athletes. high and low speed in the experimental and control groups. A more significant increase in time was shown by the group that received knowledge of performance and knowledge of result feedback both in the high-speed class and in the low-speed class. Even though both of them experienced an increase in time, in the low speed class the group receiving knowledge of performance and knowledge of result feedback was more significant than the group receiving feedback from the high speed class. So it can be concluded by providing knowledge of performance feedback and knowledge of results on being able to provide an increase in performance time for beginner mountain bike racing athletes).

Keywords: feedback, mountain bike, knowledge of performance, knowledge of result

INTRODUCTION

Providing feedback is an important part of a learning process or training process because it is one of the efforts to observe related to how students carry out activities and what the teacher must do to improve the student's ability (Suherman, 1998. P. 124). In the terminology of a closed loop system, feedback is considered as information about errors (Schmidt & Lee, 2014). Therefore, giving feedback is the main mechanism in the development and improvement of learning (Mutch, 2003).

According to Rink (1985, p.34) "feedback is as sensory information that a person receives as a result of responding to it. Meanwhile, according to Lutan (1988, p.300) Feedback is knowledge obtained regarding a task, action or response that has been given.

Performance sports cannot be separated from feedback, according to Harsono (1988, p.87) "Athletes need feedback to find out how their training results are, what still needs to be considered and emphasized in exercises to progress their achievements." Meanwhile, according to Apruebo (2005, p. 99) "states that feedback places more emphasis on training activities with regard to information from the coach related to the level of motor skills or the performance of the athlete as a basis for developing the appearance of the athlete". So that feedback is needed in the process of sports achievement training.

Feedback is divided into 2, namely Inherent Feedback and Augmented Feedback (Schmidt & Lee, 2014). Inherent Feedback is feedback that comes from within oneself, namely in the form of self-assessment regarding what has been done in the form of attitudes, activities and about the abilities that have been addressed (Apruebo, 2005. p.99). Because the nature of Inherent feedback is self-assessment, this feedback is not effective if students or athletes do not know the proper movement patterns, therefore this feedback requires additional feedback which is called Augmented Feedback.

Augmented feedback is additional feedback that comes from outside or extrinsic feedback, usually in the form of corrections from the teacher or corrections from the coach. (Apruebo, 2005. p.99). This feedback as a source of information presented externally to distinguish information from sources of information that are naturally or inherently available for an actor to evaluate his actions (Anderson, 1995). Therefore the importance of Augmented feedback in a training or learning process to complement the information of a movement to be achieved.

In this study the authors will discuss augmented feedback or additional feedback only. Traditionally, additional information feedback has been classified into two main categories: knowledge of result and knowledge of performance (Mononen, Viitasalo, Konttinen, & Era, 2015).

Knowledge Of Result (KR) is information provided regarding the results of what has been done in meeting certain goals (Salmoni, Schmidt, & Walter, 1984). Knowledge of result (KR) becomes feedback that is inherent in every learning or training because of the nature of knowledge of result (KR) which provides true and false information or achieved and not achieved goals in learning or training. So (Trowbridge & Cason, 2010) argues that a learning without knowledge of result (KR) is the same as no learning.

In many learning situations, instructors provide information about movement patterns produced by athletes, this information is known as knowledge of performance, or KP (Gentile, 2012). Knowledge of performance (KP) is often presented as a function of goals or movement patterns; that is, Knowledge of performance (KP) is placed above movement patterns. By using this approach, students have demonstrated that knowledge of performance has potential benefits for improving motion learning outcomes (Brisson, Alain, & Brlsson, 2010).

Knowledge of performance (KP) improves skills, (Mononen, Viitasalo, Konttinen, & Era, 2003) in their research Knowledge of performance feedback can improve accuracy skills in shooting in shooting sports. Whereas in research (Wallace, S. A., & Hagler, R. W., 2013) knowledge of performance feedback can improve skills in shooting techniques in basketball. From the two studies above, knowledge of performance feedback can improve skills in two different sports, the first from sports that use minimal physical abilities (shooting) and the second from sports that use more physical abilities from shooting (basketball). So the authors found a void that they wanted to examine, how does knowledge of performance feedback affect sports.

METHOD

The research method used in this study is experimental. This research is intended to determine whether there is a result of a treatment or treatment imposed on the subject. According to Fraenkel, Wallen, & Hyun (2013) explained "In an experimental study, researchers look at effect(s) of at least one independent variable on one or more dependent variables." This means that it is experimental research to examine the existence of a causal relationship from the treatment given.

In this study, researchers used a 2 x 2 factorial design. Sugiyono (2013) explained that a factorial design is a design that takes into account the possibility of a moderator variable that affects the treatment (independent variable) of the outcome (dependent variable). In this study, which consisted of high speed and low speed had a role as a moderator variable to see whether there were other influences affecting the treatment of the independent variable which consisted of providing knowledge of performance feedback on improving the performance of beginner mountain bike racing athletes (the dependent variable).

Table 1. Research design

Test Results	Feedback	
	KP and KR (A1)	KR (A2)
Speed		
Height (B1)	A1B1	A2B1
Low (B2)	A1B2	A2B2

Information:

1. A1 = Providing Knowledge of Result Feedback with Knowledge of Performance
2. A2 = Providing Knowledge of Result Feedback
3. B1 = Athlete with high speed ability
4. B2 = Athlete with low speed capability
5. A1B1 = Sample group given KR and KP feedback with high speed capability
6. A2B1 = Sample group provided with KR feedback with high speed capability
7. A1B2 = Sample group given KR and KP feedback with high speed capability
8. A2B2 = Sample group given KR and KP feedback with low speed capability

Location, population, and research sample

A. Location

The location that will be used as a research location is a single uphill track in the KIIC area of Karawang Regency. .

B. Population

The population is a group of objects that are targeted in a study or in other words it is the whole of the research object. Fraenkel, Wallen & Hyun (Fraenkel, Wallen, & Hyun, 2012) states that "The population, in other words, is the group of interest to the researcher, the group to whom the researcher would like to generalize the result of the study " . In this regard, the population is members of The Bully Cycling team and ISSI Karawang beginner athletes who have basic cycling skills.

C. Sample

The sample is part of the number and characteristics of the population. What will be learned from the sample will be applied to the population. Samples taken from the population must be representative (representative). The sample in this study was taken using a purposive sampling technique, which is a sampling technique used by researchers if the research has certain

considerations in taking the sample or determining the sample for a particular purpose. meaning that the sample method involves taking a selection from a representative population and using the collected data as research information (Latham, 2007) . The sample is a "subgroup of the population". In this opinion the samples taken must really be representative of the existing population so that in the end you do not make inaccurate conclusions

Research Instruments

Time test doing climbing techniques in the KIIC area of the district. Karawang.

RESULTS

After conducting research on the effect of training by providing feedback and speed on the performance of beginner athletes in mountain bike racing number XC, research data was obtained that described the results of the training effect . The following is an explanation of the data obtained after providing feedback ..

Table 2. Results obtained

Mountain Bike Racing Beginner Athlete High Speed Data T-Test Number XC			
Data Type	.sig	α	Decision
Speed	0.039	0.05	H_0 is rejected

From the table, the probability value/ .sig is 0.039 which is less than 0.05; then according to the existing criteria H_0 is rejected. It can be interpreted that there is a significant difference between the pretest and posttest scores on speed in the high speed group after being given feedback exercises.

1.1. Low Speed Data T Test Mountain Bike Racing Beginner Athlete Number XC

Data analysis on the effect of training with feedback and speed on the performance of beginner athletes in mountain bike racing number XC used the T-Test to distinguish the two average speeds in the low speed group between the pretest and posttest in the experimental group.

The hypothesis taken is as follows:

H_0 : There was no significant difference between the pretest and posttest speed values in the low speed group after being given feedback training .

H_1 : There was a significant difference between the pretest and posttest values for speed in the low speed group after being given feedback training

Hypothesis acceptance criteria:

- If probability / .sig < 0.05 then H_0 is rejected,
- Conversely, if the probability/ .sig > 0.05 then H_0 is accepted.

The results of the calculations can be seen in table 4.4 below :

Table 3. Mountain Bike Racing Beginner Athlete Low Speed Data T-Test Number XC

Data Type	.sig	α	Decision
Speed	0.001 _	0.05	H_0 is rejected

From the table it is obtained that the probability value/ .sig is 0.001 which is smaller than 0.05; then according to the existing criteria H_0 is rejected. It can be interpreted that there is a significant difference between the pretest and posttest scores on speed in the low speed group after being given feedback exercises.

1.2. Control Group Data T Test and High Speed Experiment Group Athlete Beginner Mountain Bike Racing Number XC

Data analysis on the effect of training with feedback and speed on the performance of beginner athletes in mountain bike racing number XC used the T-Test to distinguish the two average speeds in the high-speed group between the control group and the experimental group.

The hypothesis taken is as follows:

H_0 : There is no significant difference between the speed values of the control group and the experimental group in the high speed group .

H_1 : There was a significant difference between the speed values of the control group and the experimental group in the high speed group

Hypothesis acceptance criteria:

- If probability / .sig < 0.05 then H_0 is rejected,
- Conversely, if the probability/ .sig > 0.05 then H_0 is accepted.

The results of the calculations can be seen in table 4.5 below :

Table 4. High Speed Data T-Test Control Group and Experiment Group of Mountain Bike Racing
Beginner Athletes Number XC

Data Type	.sig	α	Decision
Speed	0.000 _	0.05	H ₀ is rejected

From the table it is obtained that the probability value/ .sig is 0.000 which is less than 0.05; then according to the existing criteria Ho is rejected. It can be interpreted that there is a significant difference between the speed values of the control group and the experimental group in the high speed group.

1.3. T Test Data of Control Group and Low Speed Experiment Group of Beginner Athletes of Mountain Bike Racing Number XC

Data analysis on the effect of training with feedback and speed on the performance of beginner athletes in mountain bike racing number XC used the T-Test to distinguish the two average speeds in the low speed group between the control group and the experimental group.

The hypothesis taken is as follows:

H_0 : There is no significant difference between the speed values of the control group and the experimental group in the low speed group .

H_1 : There is a significant difference between the speed values of the control group and the experimental group in the low speed group

Hypothesis acceptance criteria:

- If probability / .sig < 0.05 then Ho is rejected,
- Conversely, if the probability/ .sig > 0.05 then Ho is accepted.

The results of the calculations can be seen in table 4.6 below :

Table 5. Low Speed Data T-Test Control Group and Experiment Group of Mountain Bike Racing
Beginner Athletes Number XC

Data Type	.sig	α	Decision
Speed	0.000 _	0.05	H ₀ is rejected

From the table it is obtained that the probability value/ .sig is 0.000 which is less than 0.05; then according to the existing criteria Ho is rejected. It can be interpreted that there is a significant

difference between the speed values of the control group and the experimental group in the low speed group.

DISCUSSION

After analyzing the data through statistical calculations, several findings emerged from this study. Feedback is an effort to observe students regarding how they carry out activities and what the teacher must do to improve the student's abilities. In this study the ability to be improved is speed.

In the high-speed group, after being given a feedback approach to the training process. After experiencing the training process, athletes experienced an increase in speed of 0.33 m/s. The increase in speed also occurred in the low speed athlete group. The resulting increase in speed is 0.28 m/s. There are differences in the increase in speed in the high and low speed groups, this is assumed to be a factor of the motor skills of each group that are different.

Each training process will certainly experience changes in the ability of each athlete. In the comparison of the increased scores of the experimental and control groups, there were differences in the increase in speed ability. In the high speed group the difference in speed increase was 0.12 m/s and in the low speed group the difference in speed increase was 0.1 m/s. From the two comparisons, the experimental group, which was given a feedback approach during the training process, had a greater improvement compared to the control group, which was not given a feedback approach during the training process.

The findings reveal that an effective feedback approach is given during the training process in an effort to increase the speed of XC number mountain bike beginner athletes. Providing feedback that is specific to the type of augmented feedback, which is information provided from an external source that is in addition to the perception of the actuator (Hegarty, 1996). Augmented feedback or augmented feedback serves to complement the information available naturally (inherently). During the training process athletes receive information about basic techniques, mistakes made, performance analysis, and suggestions that can be made to increase speed.

Giving feedback serves to find out information about errors (Schmidt & Lee, 2014). So that by giving feedback can correct mistakes made in skills. Providing feedback as the main mechanism in the development and improvement of learning (Mutch, 2003). Additional feedback information has been classified into two main categories: knowledge of result and knowledge of performance (Mononen, Viitasalo, Konttinen, & Era, 2015).

Knowledge of Performance (KP) feedback, sometimes referred to as “kinematic feedback,” is additional information about the recently created movement pattern (Schmidt & Lee, 2014) . Knowledge of Performance (KP) is information about movement execution (Gentle, 2012) . Speed is an ability that is determined by basic movement or basic skills and physical conditions, especially in the aspect of power. For beginner athletes, of course, priority will be given to mastering basic movements. From general to specific basic movements that support athletes to display maximum speed.

Gentile (2012) states that knowledge of performance is the most effective form of information for acquiring close skills . In cross-country mountain bike races (XC) it is necessary to know about the pattern of the movement goals, according to (Newell et al., 2013) knowledge of performance is useful for learning, especially when the pattern of goals is not known by the subject.

CONCLUSIONS

Conclusions are obtained after carrying out the research process, from implementation, data processing, to the presentation of research findings. The conclusions of this study are:

1. There is a positive effect from the use of the feedback approach in the training process of beginner mountain bike athletes number XC on performance (increased speed),
2. There is an interaction between the use of the feedback approach and speed in the training process for beginner mountain bike athletes number XC on performance (speed increase),
3. The use of the feedback approach is more effective in improving the performance of XC mountain bike beginner athletes in the high speed group compared to the group that was not given a feedback approach, and
4. The use of the feedback approach was more effective in improving the performance of XC number mountain bike beginners in the low speed group compared to the group that was not given a feedback approach.

Conflict of Interest

The author(s) declare that they have no conflict of interest.

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