
Internal and External Imagery on Sports Performance among Swimmers

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Abstract

Imagery has been defined as “using all the senses to re-create or create an experience in the mind”. Imagery has both a cognitive and motivational function. The cognitive function of imagery is the use of mental imagery to experience specific sports skills and to plan strategies in advance for competitions. The motivational function of imagery is the use of imagery to experience goal attainment, effective coping and arousal management requirements. The mental practice literature provides evidence that imagery is an effective cognitive process for enhancing learning and performance of motor skills. The main aim of this study was to correlate the usage of imagery and sports performance among swimmers. Data was collected from 69 swimmers during a match among universities, using Imagery and Sports Performance questionnaire. One way ANOVA showed significant differences on the level of Imagery Usage among categories of swimmers, $F(3, 69) = 15.310, p < .01$. Pearson correlation was used to determine the relationship between imagery and sports performance. The results indicated a positive correlation between internal imagery and sports performance, ($r = 0.77; p < 0.01$), and external imagery and sports performance, ($r = 0.74; p < 0.01$). Sports psychologists, sports counselors and coaches should use the present findings to recommend imagery to enhance athletes' performance.

Key Word: Imagery, Internal, external, sport performance

Background of the Study

Imagery has been defined as “using all the senses to re-create or create an experience in the mind” (Cox, 2011). In other words, mental imagery is recalling a memory that stored in the brain into meaningful images. It involve senses such as visual, kinesthetic, auditory, tactile and olfactory. Mental imagery is a cognitive rehearsal in the absence of physical movement to imagine sports performance in the mind. A powerful imagination leads to creation of nerve impulse similar to those generated during real performance. Imagery is the language of the brain. In a real sense, the brain cannot notify the

difference between an actual physical event and the vivid imagery of the same event. Therefore, imagery can be used by the brain to provide powerful repetition, elaboration, intensification and preservation of important athletic sequences and skills (Cox, 2011; Ampofo-Boateng, 2009).

The application of mental practice was used for long time and the effectiveness of this technique was proven to enhance athletes' performance besides reducing their anxiety (Mousavi & Meshkini, 2011). Many researches had proved that imagery has a great tendency to improve performance, reduce anxiety, enhance concentration and self-confidence (Cox, 2011; Doussoulin & Rehbein, 2011; Mousavi & Meshkini, 2011; Ampofo-Boateng, 2009). Imagery is the most common technique used in improving the performance of athletes in competitive situations.

Mental Imagery can be divided into two types namely, internal imagery and external imagery (Ampofo-Boateng, 2009). Internal imagery means the athletes visualize themselves as doing the task while, external imagery means the athletes visualize themselves from a third-person's perspectives. In other words, the situation of visualizing the tournaments in your mind, can be called as internal imagery. While external imagery is when the athletes watch the other opponent in the match or they use video clips to see the tournaments. According to Ranganathan, Siemionow, Liu, Sahgal and Yue (2004), external imagery produces little physiological responses as internal imagery does and, thus, it is not effective in enhancing muscle forces. Therefore, it is important to conduct a research to determine the effect of internal and external imagery on sports performance.

An important finding associated with mental practice is that advanced performers benefit from mental practice to a much greater extent than beginners (Cox, 2011). High skilled athletes use imagery techniques more frequently than low skilled athletes. Therefore, high skilled athletes perform better in sports than low skilled athletes. However, not much research had done to prove it. Among novice athletes, they rarely used mental imagery techniques and it is more affected in professional player's performances.

Psycho neuromuscular theory posits that imagery results in subliminal neuromuscular patterns are identical to the patterns used during the actual movement. Even though the imagined event does not result in an overt movement of the musculature, but the subliminal efferent commands are sent from the brain to the muscles. Hence, the neuromuscular system is given the opportunity to "practice" a movement pattern without really moving the muscles.

Objective

The aim of this research is to identify the usage of imagery among swimmers. In other words, the rationale for this study is designed to determine the usage of imagery among swimmers from different ranking namely national, state, district and university in their sports performance. In addition, this research also aims to identify the effects of different types of mental imageries such as the internal imageries and external imageries on swimmers performance. This would lead in identifying the best types of mental practices that is very effective in improving the athletes' performances.

Methods

The players in this study were trained to play for inter-varsity swimming matches. The instrument used for this study comprised of a 25-item Imagery Questionnaire and Sport Performance Scale (SPS). The sample consisted of 69 swimmers, including the national athletes (N=17), state athletes (N=20), district athletes (N=15) and university athletes (N= 17).

Result and Discussion

Respondents' Profile

The respondents' profile described their ranking, ethnic and age. Table 1 shows the overall results of the respondents' profile for 69 swimmers. The overall mean age for these respondents was 21.81 years old. The age of male respondents varied from 18 to 26 years, where the mean age was 22.95 years old. The age of female players ranged from the minimum of 18 to the maximum of 25 years old. The mean age for female respondents was 21.19 years old.

The variable "rank which is gathered through this study is categorized into four levels namely, national, state, district and university. The result showed that 17 respondents had participated at national, whilst 20 respondents participate at state, 15 had participated at district and 17 respondents participated at the university level. Majority of the respondents, were undergraduates for Degree (n=54) and Diploma (n=15) programmes.

Table 1: Respondents' Profile (n=69)

| Variables | Frequency | Percentage | Mean | SD |
|-----------------------------------|-----------|------------|-------|------|
| Athletes according to rank | | | | |
| National | 17 | 24.64 | | |
| State | 20 | 28.98 | | |
| District | 15 | 21.74 | | |
| University | 17 | 24.64 | | |
| Programme | | | | |
| Diploma | 15 | 21.74 | | |
| Degree | 54 | 78.26 | | |
| Age | | | | |
| Male | | | 22.95 | 1.79 |
| Female | | | 21.19 | 1.98 |
| Overall | | | 21.81 | 1.49 |

Cronbach Reliability Coefficients

In this study, Cronbach alpha coefficients were found relatively high, ranging from .83 to .86 (Table 2).

Table 2: Cronbach Reliability Coefficients

| Questionnaire | Cronbach's Alpha (n=69) |
|-----------------------------------|-------------------------|
| Imageries (Internal and External) | .8317 |
| Sports Performance | .8622 |

Imagery Items

Imagery item were evaluated. Internal Imagery has the highest mean ($\bar{x} = 24.4512$) compared to External Imagery ($\bar{x} = 20.3021$).

Table 3: Imagery Items among Swimmers

| Imagery Items | Mean |
|------------------|---------|
| Internal Imagery | 24.4512 |
| External Imagery | 20.3021 |

4.4 Level of Imagery Usage among Swimmers from different rank

One way ANOVA showed significant differences on the level of Imagery Usage among swimmers, $F(3, 69) = 18.442, p < .01$. (Table 4).

Table 4 : Level of Imagery Usage among Swimmers from different rank

| Atheletes According to Rank | Imagery Usage | |
|-----------------------------|---------------|---------|
| | Mean | Value-F |
| National | 27.3144 | 18.442* |
| State | 24.4107 | |
| District | 21.7121 | |
| University | 17.4255 | |

* $p < 0.01$

Table 5: Pos Hoc Tukey: Level of Imagery Usage among Swimmers from different rank

| Atheletes According to Rank | National | State | District | University | N |
|-----------------------------|----------|-----------|------------|------------|----|
| National | | *(1.1142) | * (1.6347) | * (2.0012) | 17 |
| State | | | * (1.3142) | * (1.7782) | 20 |
| District | | | | * (1.3109) | 15 |
| University | | | | | 17 |

* $p < 0.05$

The result showed that swimmers represented university exhibited lower level of imagery usage than athletes from district, whereas national and state athletes showed the highest levels of imagery usage.

So far, no research done in Malaysia, involving swimmers from these four rank. Therefore, this research fails to compare with previous researches completed. However, there are a few research showed that elite athletes uses more imagery techniques.

Research of Orlick and Partington (1988) indicated that 99% elite athletes of Canada Olympics used imagery techniques.

Sports Performance of Swimmers from 4 different ranking

One way ANOVA showed significant differences on the rank of sports performance among swimmers, $F(3, 69) = 13.224, p < .01$. (Table 6).

Table 6 : Level of Sport Performance among Swimmers from different rank

| Atheletes According to Rank | Sport Performance | |
|-----------------------------|-------------------|---------|
| | Mean | Value-F |
| National | 19.4677 | 13.224* |
| State | 16.0041 | |
| District | 12.1256 | |
| University | 10.1040 | |

* $p < 0.01$

Table 7: Pos Hoc Tukey: Level of Self Performance among different ranking of Swimmers

| Atheletes According to The Rank | National | State | District | University | N |
|---------------------------------|----------|-----------|-----------|------------|----|
| National | | *(1.3329) | *(1.5781) | *(1.3245) | 17 |
| State | | | *(1.5617) | *(1.8901) | 20 |
| District | | | | *(1.2013) | 15 |
| University | | | | | 17 |

* $p < 0.05$

The result showed that swimmers from the district rank exhibited lower level of sport performance compared to athletes from the state and university rank, whereas national athletes showed the highest levels of sport performance.

Athletes ranking is one of the most important variables that either facilitate or dampen the performance of the athletes. National and state swimmers exhibited higher level of performance with a lot of experience and success in sport, and high level of imagery usage, therefore it is not amazing that they scored the highest for their sport performance.

The types of Imagery and Sport Performance

The correlation coefficient of 0.77 was noted between the usage of Internal Imagery and sport performance in the evaluation of 69 swimmers, which is significant ($P < .01$). Besides that, positive coefficient of 0.74 was also noted between the usage of External Imagery and sport performance

In other words, the positive relationship existing between these variables is statistically significant (Table 5). Positive correlation indicates that both variables increase or decrease together.

Table 8: The Relationship between Types of Imagery and Sport Performance among swimmers

| Types of Imageries | Sports Performance |
|--------------------|--------------------|
| Internal Imagery | 0.77** (0.000) |
| External Imagery | 0.74** (0.000) |

** p<.01

The result showed that Internal and External Imagery improves sport performance. The research finding completed by Driskell, Carloyn and Moran (1994) supports the use of mental imagery to enhance the sport performance. The result showed that there were significant effects of the mental imagery on sport's performance. Research of Suedfeld and Bruno (1990) and, Lohr and Scogin (1998) showed that the imagery techniques tend to reduce the level of anxiety and this helps to enhance their performances.

Conclusion

The result of this research showed that there is a positive correlation between internal and external imagery with sports performance among swimmers. The usage of all the sensory experiences like visual, kinesthetic, auditory and olfactory using both internal (first person) and external (third person) imagery perspectives to view the images that enhanced sports performance. Many sports such as swimmers, not only require physical skills, but also a strong mental game as well.

This study had given a better understanding to the coaches and athletes that mental imagery enhances sport performance of swimmers. Sport psychologists, sport counselors and coaches should use the present findings to recommend imagery strategies to universities and district ranking athletes to increase their level of performance.

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