

Impact of Long-Distance Swimming “Enei” on Japanese University Students’ Grit

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Abstract

Long-distance swimming for children is recognized for its educational effect. However, there is a lack of understanding about the effects of long-distance swimming on university students. Therefore, this study conducted a questionnaire-based survey on participants of a long-distance swimming practice at a university to clarify the effects of long-distance swimming on their grit. The period of the survey is July 8-14, 2018. The survey was conducted before and after the program and the grit scores were analyzed using the Grit scale. The results showed that the grit and perseverance scores, which are subscale on the grit, were significantly higher post long-distance swimming. This suggests that university students’ grit is impacted by long-distance swimming and increased non-cognitive abilities is one of the effects of the same.

Keywords

Non-Cognitive Skill, Swimming, Sea, Outdoor Education, School Event

1. Introduction

Long-distance swimming (“Enei” in Japanese) is one of the traditional school events in Japan. Enei was first practiced in 1902 at the Tokyo Teachers College. Since then, it has not only gained popularity throughout Japan, but has also been incorporated into the swimming practice of the current school curriculum (Kimura & Yano, 2013). Enei for children is, “Schools involved, and individuals or groups who plan to swim for a certain distance or time (Kimura & Yano, 2013: p. 2).”

According to Sano (1968), the significance of Enei in school education lies in its role regarding physical and mental abilities, improvement of skills, coexis-

tence with nature (natural education, safety education), and so on. The educational effect of Enei on children is widely recognized (Shibazaki, 2009; Fujiwara et al., 2018). Yano (2007) suggested that Enei effectively improved the “zest for living” and positively influenced the psychological and social abilities, the components of “zest for living”.

However, the number of schools that practice traditional Enei for its educational effects is decreasing. One of the reasons is the lack of instructors (Shimizu, 1993; Yano et al., 2005). To resolve the shortage of instructors, it is important that teachers recognize the educational value of Enei. However, Enei is not included in the teacher training course (Higashiyama & Oishi, 2012; Ikegami et al., 1999; Tanaka et al., 2000). Yano et al. (2005), Tanaka et al. (2000), Honda et al. (2018) state that many Japanese universities with a faculty of Physical Education or school of Education include long-distance swimming at sea in the curriculum of specialized subjects. This is because students aim to contribute towards coastal learning once they become teachers in the future. However, the actual situation is still not understood.

According to Higashiyama & Oishi (2012), there were only 4 universities that practiced Enei (both required course and required compulsory course) among the 24 “National Physical Education University Presidents and Undergraduate Deans Participating Universities”. Fujiwara et al. (2015) reported that only 21.6% of teachers’ colleges practiced Enei in 2014.

So far, research on the physical (Fujiwara et al., 2002; Ikegami et al., 1999; Suzuki et al., 2009) and psychological aspects (Ikehata et al., 2002; Fujiwara et al., 2002) of Enei have been conducted involving university students. According to Ikehata et al. (2003), anxiety about swimming and external environment is high during Enei and the verification of self-esteem and self-efficacy is listed as an issue. Additionally, Miyake & Saijo (2006) showed that successful completion of Enei can lead to awareness of self-competency and transformation of consciousness about anxiety. However, nothing else has been studied about Enei involving university students. Therefore, there is a lack of understanding of its effects on them.

Enei can create a big impression owing to the challenges faced at sea, overcoming difficulties without giving up until the end, and sharing the experience with friends. This is what makes it potentially effective on adults’ non-cognitive abilities, especially, grit. Grit measures the perseverance to do things without giving up until the end. Grit is also considered to be one of the non-cognitive abilities that predict future success more precisely than self-control. Duckworth et al. (2007) define grit as, “Perseverance and consistency towards achieving long-term goals”. Duckworth & Kanazaki (2016) developed the Grit scale, which consists of two elements: “consistency” and “permanence.” So far, researches on grit have been conducted in fields, such as sports (Yamakita et al., 2017) and exercise behavior (a survey of Grit and exercise behavior), wherein the relationship between exercise habits and grit has been clarified (Yamakita et al., 2018). However, the link between Enei and grit remain unclarified. Therefore, this study aimed at clarifying the impact of Enei on university students’ grit.

2. Methods

2.1. Participants

Details of the participants are shown in **Table 1**. The survey participants included 749 students (478 males and 271 females) of a sports science university who participated in the swimming practice at the beach in 2018. This university is in Tokyo, and the university has been practicing beach training focused on Enei since the past 60 years. Its purpose is to master the “founding spirit”, that is, “It is essential for realization of rich and sustainable society the cultivation of human persons who are healthy physically and mentally, and promote spread and development of sports”. Through Enei, which requires mental strength and overcoming hurdles with friends, students can learn the core spirit of the university, practically. Therefore, practical training, which includes Enei at this university, is viewed as a way to build the identity of the students (Nippon Sports Science University Swimming Laboratory, 2015).

The outline of the training is shown in **Table 2**. The period of the implementation was July 8-14, 2018. The participants were split into two groups and the implementation lasted four days. Hour long swimming training was conducted twice a day during the four days and Enei was held in the afternoon and morning of the third and fourth days, respectively. This was conducted based on the levels of the groups. In the first group, 232 students were in the higher swimming skill and the others in the lower swimming skill groups. All the 232 strong swimmers swam completely. The distance was 3900 m, time taken was 138 minutes, and swimming speed was 28.3 m/min. Out of 117 lower skilled swimmers, 116 swam completely. The distance was 1150 m, time taken was 68 minutes, and

Table 1. Demographics of students.

	n	%
All	670	100.0
Sex		
Male	426	63.6
Female	244	36.4
Belong to athletic club		
Belongs	543	81.0
individual	237	43.6
team	287	52.9
Independent	127	19.0
Swimming ability		
Over 100 m	142	21.2
50 - 100 m	287	42.8
25 - 50 m	169	25.2
Less than 25 m	64	9.6

Table 2. Outline of the practice.

Period	July 7-14
Place	Iwai beach Chiba prefecture
1 squad	July 8-11
2 squad	July 11-14
Main program	
Day 1	Departure, opening ceremony, swimming ability test, learning lecture
Day 2	Long swimming training, rescue method, learning lecture
Day 3	Long swimming training, rescue method, large long swimming, learning lecture
Day 4	Long swimming, closed school type

swimming speed was 16.9 m/min. In the second group, 214 participated in the Enei as the strong swimming group and 133 as the not strong swimming group. All the 214 participants who participated in the strong swimming group completed the swim. The distance was 3420 m, time taken was 127 minutes, and the swimming speed was 26.9 m/min. In the not strong swimming group, 132 of 133 participants completed the swim. The distance was 1600 m, time taken was 64 minutes, and swimming speed was 25.0 m/min.

In this study, 670 people excluding the missing value among the data on 716 participants were the target of analysis. This was the total number of participants of the first (335 people: 186 men, 149 women) and second groups (335 people: 240 men, 95 women). The attributes of the target of analysis were: age 19 - 21 years, 426 males and 244 females. There were 543 participants belonging to the university's sports clubs and 127 people who did not. Among them, 237 played individual events and 287 played group events. Regarding the swimming ability, 142 could swim 100 m or more, 288 from 50 m to less than 100 m, 169 from 25 m to less than 50 m, and 64 under 25 m.

2.2. Procedure

The survey targeted all practice participants. On the first day of practice, the questionnaires (pre and post) were distributed to all the participants and the pre-survey was conducted. The post-survey was conducted after the end of Enei immediately after the practice. The recovery rate was 100%. Prior to conducting the survey, the [ANONYMOUS]'s Ethics Committee for Research on Human Subjects (approval number 018-H047) approved the study.

2.3. Analysis

This survey used the Japanese version of the Short-Grit scale (Nishikawa et al., 2015), the reliability of which has been confirmed for adults. Grit's evaluation has eight items (a: I accomplish what I started, b: I am a hard worker; c: it is difficult for me to keep myself interested in a plan that takes months to finish; d: I never lose sleep over anything; e: I get bored by what I become absorbed in soon

after a while; f: once I set a goal, I often turn to another goal; g: I am diligent; and h: when I come up with a new idea or plan, I lose interest from the previous). There are five answer items for each question scored from one to five points: one implies “does not fit” and five implies “fit” (c, e, f and h are reversed scores). The total points are considered the grit score (maximum of 40 points). The Grit scale consists of two subscales, “perseverance” (question items a, b, d, g) and “consistency” (c, e, f, h). The total points for each (up to 20 points) are calculated. The “repeated measurement analysis of variance” was used for analysis. The relationship between pre and post scores of grit, pre and post scores of perseverance, and pre and post scores of consistency as intra-subject factors were examined. The covariates were sex, swimming ability, and belonging a club. Statistical software “SPSS 24” was used for analysis for the “repeated measurement analysis of variance”. A significance level of 5% (and a significance trend of 10%) was considered statistically significant.

3. Result

The results are shown in **Table 3**. The comparison of pre and post-grit scores showed that the latter tended to be higher than the former (scoring estimated marginal mean pre = 25.484, post = 26.436, standard error pre = 0.172, post = 0.190, $p = 0.057$). The comparison of pre and post-perseverance scores, which are subscales, showed the same trend (estimated marginal average pre = 13.710, post = 14.519, standard error pre = 0.114, post = 0.122, $p = 0.007$). The comparison of pre and post-consistency scores, which are subscales, indicated that scores remained unchanged (estimated marginal average pre = 11.774, post = 11.917, standard error pre = 0.116, post = 0.130, $p = 0.91$).

4. Discussion

This study used grit scores as an indicator of the effect of Enei to clarify its impact on university students’ grit. Therefore, a survey was conducted on apprentices who participated in the beach practice at a sports science university. The results revealed the post scores to be higher than the pre scores. Regarding the subscale, the post-perseverance scores were higher than pre-perseverance scores and the consistency scores remained unchanged.

Table 3. Resart (comparison of Grit score pre and post).

	Grit score (pre-post)	Perseverance score (pre-post)	Consistency score (pre-post)
Estimated marginal average of points (pre)	25.48	13.71	11.77
Estimated marginal average of points (post)	26.44	14.52	11.92
Standard error pre	0.17	0.11	0.12
Standard error post	0.19	0.12	0.13
<i>p</i>	0.057	0.007	0.91

The grit score was the sum of the perseverance and consistency scores. Perhaps the difference between the grit scores' pre and post scores were not clear because the grit score was strongly influenced by the consistency score. One of the reasons why the consistency scores were unchanged was the very short practice period. Grit's definition is, "Perseverance and consistency to achieve long-term goals (Duckworth et al., 2007)." The implementation period of this practice was four days and this was not a long-term effort to achieve the goal. The content of the question items on the consistency subscale used in this study questioned the possibility of maintaining high motivation for a long time or the possibility of achieving the goal in a planned way. It can be considered that the composition of the program itself was not structured to improve consistency.

On the other hand, the perseverance scores showed improvement. The contents of the question were, "I accomplish what I started", "I am a hard worker", and "I never lose sleep over anything". These were easy to concretely imagine during Enei. The students participating in Enei imbibed patience and self-confidence through the experience of overcoming hardships. Duckworth & Kanzaki (2016) states, "A painful experience strengthens the adventurous spirit. By experiencing harsh difficulties outdoors, patience and toughness are cultivated, and an independent, confident and positive attitude is developed. Furthermore, the conviction that 'most things in life can be carried out independently' is cultivated." Hence, it is possible that despite a short four days' program, the sense of accomplishment and confidence by overcoming hardships and difficult situations affected the perseverance scores.

Duckworth & Kmizaki (2016) also claimed that through "growth thinking", optimism, tenacity, bravery to stand up to the new tasks without hesitation and with strength could be cultivated. For this, training the brain like muscles by, "changing the way of thinking about intelligence and talent", "practicing to think optimistically", and "to seek human help" was proposed. In this practice, the students who participated in Enei developed "growth thinking" gradually over four days. Therefore, it is possible that they cultivated optimism against adversities and that such consequences improved the patience scores.

On the other hand, Shimamoto et al. (2017) indicated, "The maintenance of psychological support for athletes leads to the continuation of their career. However, experiencing difficult situations several times could negatively affect their mentality." During Enei, there were many occasions where participants could get over difficult situations with their fellow participants, perceived as psychological support from their friends. Furthermore, Endo et al. (2016) presented a self-growth model. The model shows that overcoming adversities by children during their natural experiences leads to their self-growth. Keeping "maintaining mental support" by their peers is one of the external factors of self-growth. It suggests that owing to overcoming such difficult situations, experiences of gaining confidence, and psychological support by peers enable them to accept adversities positively, affecting their patience scores. The university students' Enei experience influences grit and enhances their non-cognitive abilities.

The limitation of this study lies in its inability to be generalized for all university students because it is a special case involving a sports science university's students. Future studies must consider general universities and children.

5. Conclusion

The grit and perseverance (subscale of grit) scores were significantly higher after Enei. Thus, Enei impacts university students' grit scores and enhancing their non-cognitive abilities is one of its effects.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendix

This study examines the effects of long-distance swimming experiences on non-cognitive Grit. Your free will is respected. The survey will be conducted twice before and after the long swim.

Before long-distance swimming (Enei)

Q: There are no right or wrong answers, so answer the following 8 questions. Please choose one answer from 5 numbers below 1 - 5.

- a): I accomplish what I started;
- b): I am a hard worker;
- c): It is difficult for me to keep myself interested in a plan that takes months to finish;
- d): I never lose sleep over anything;
- e): I get bored by what I become absorbed in soon after a while;
- f): Once I set a goal, I often turn to another goal;
- g): I am diligent;
- h): When I come up with a new idea or plan, I lose interest from the previous.

1 = does not fit

2 = not really fit

3 = neither

4 = slightly fit

5 = fit

Q: Face sheet

- a): Sex
- b): Age
- c): Existence of exercise
- d): School sports club
- e): Competition events
- f): Swimming ability
- g): Swimming experience

After long-distance swimming (Enei)

Q: There are no right or wrong answers, so answer the following 8 questions. Please choose one answer from 5 numbers below 1 - 5.

- a): I accomplish what I started;
 - b): I am a hard worker;
 - c): It is difficult for me to keep myself interested in a plan that takes months to finish;
 - d): I never lose sleep over anything;
 - e): I get bored by what I become absorbed in soon after a while;
 - f): Once I set a goal, I often turn to another goal;
 - g): I am diligent;
 - h): When I come up with a new idea or plan, I lose interest from the previous.
- 1 = does not fit 2 = not really fit
- 3 = neither 4 = slightly fit
- 5 = fit