

Algorithm for estimating comprehension from free conversation

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1. Introduction

In 2023, school club activities in Japan began to be transferred to local communities. [1]. The meaning and value of compulsory training up to the age of 12 is changing dramatically. In the midst of this change, students are expected to participate proactively in training, rather than instructor-driven training. The students' own thinking encourages active activities and enhances the effectiveness of training. However, in sports and club activities in compulsory education, the instructor-led attitude is the mainstream, and there are few situations in which students actively think.

As active educational methods are developed, methods such as PBL and active learning are attracting attention [2]. It is a method of education that encourages students to explore problem-solving methods on their own, rather than the knowledge-intensive education that has been the mainstream in Japan. Combined with online learning materials, Khan Academy has the potential to change the traditional educational method. [3].

2. Purpose & Method

The role of sports in the developmental stage of children is significant, and the expansion of PBL and active learning in this situation will help to change the attitude of being the instructor-oriented. Therefore, we analyze the content of conversations during PBL to determine the content of training. We report the correlation between the content of the conversations and the growth and change of training. This will help us to estimate an algorithm for analyzing the level of understanding of training from free conversations.

2.1 Experimental method

Skeletal muscle mass measured by a body composition analyzer and the difference between right and left muscles were used as indices of training. Skeletal muscle mass is the total amount of right arm, left arm, right leg, left leg, and trunk muscle mass, and the unit is kg. Difference between right arm and left arm, and between right leg and left leg, are expressed in kg. The MC-780A-N manufactured by Tanita Corp. Fig.1 show MC-780A-N of image.

Twenty male and twenty female subjects (10 males and 10 females) around 20 years old will be used. Based on the results of body composition, four groups of five subjects will be formed, and they will be asked to hide their identities and faces from each other using ZOOM before conducting PBL.

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Fig.1 MC-780A-N

2.2 Analytical method

Texts of free conversations collected by ZOOM are converted into text by speech recognition. The extracted text is checked by two persons in order to prevent erroneous conversion of approximately 120 minutes of conversational data.

Morphological analysis is performed on the conversational text, and the correlation between the number of occurrences of frequent words and the amount of each skeletal muscle is extracted using a stepwise method.

2.3 Result

The number of occurrences of the frequently appearing words and the amount of each skeletal muscle were tested using a stepwise method, but no significant difference was obtained. The top 10 words are shown in Table 1.

Table.1 Top 10 words

word	number
effort	58
protein	46
Left-right difference	43
Additional menu	39
Too much	33
Self-discipline	27
As much as possible	26
Break time	25
Chicken fillet	24
penalty	21

3. conclude

In this study, we conducted PBL based on anthropometric measurements on 20 subjects, and found no correlation between the words they uttered and their muscle mass and balance. However, many of the participants in the free conversation expressed their desire to improve their training based on this measurement. Therefore, there is a possibility that behavioral changes may occur based on this experiment. In the future, new findings may be obtained by conducting the measurement and PBL over a long period of time, as shown in Fig. 3.

Although we could not obtain the results with this method, we would like to continue the experiment and report the results in the future.

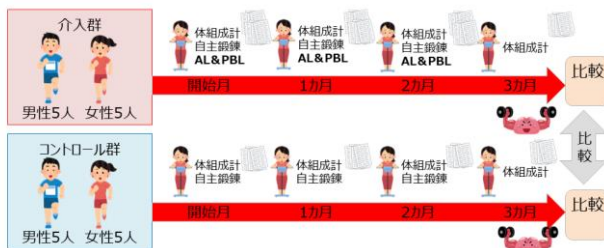


Fig.3 Future plans

Paper Acknowledgments

We are grateful thanks to Dr. Sawada of Physical Osteopathic Hospital HOPE, and Gunma athlete.

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