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Arousal of achievement motivation for learning in physical education class: a study based on the Expectancy-Affect model

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This study was designed to arouse achievement motivation for learning in physical education classes of 5th grade pupils at elementary school. A motivation training program was constructed on the basis of the Expectancy-Affect Model proposed by Nishida and Sawa (1993). The essence of the program was to increase expectancy and affect which the pupils would experience in physical education classes. This program was administered 8 times within 2 months by a physical education teacher. The results showed expected changes in the variables of the achievement motivation for learning, enjoyment, intrinsic motivation, friendships, and learning activities in physical education. These results indicated the effectiveness and applicability of the motivation training program presented in this study.

It has been a critical research theme as to how to increase children's motivation in physical education and sports. Achievement motivation for learning in physical education has been especially regarded as an essential factor in activating learning behaviors, improving motor skills, participating in sports, and facilitating mental or physical health.

From such an educational viewpoint, Nishida (1987, 1988, 1989) developed and standardized a self-report test, the Achievement Motivation in Physical Education Test (AMPET), as a measure of assessing achievement motivation for learning in physical education classes. Nishida and Sawa (1993) also presented the Expectancy-Affect Model after analyzing the determinants of achievement motivation for learning in physical education classes (Nishida et al., 1990; Nishida, 1991) and reviewing previous studies of motivation from the viewpoint of cognitive aspects (Atkinson, 1957; Bandura, 1977; Deci, 1975; Dweck, 1975; Seligman, 1975; White, 1959; Weiner, 1974). This model assumes the causal linkages among (1) the achievement motivation for learning in physical education, (2) primary factors such as perceived expectancy and affect in physical education situations, (3) secondary factors, such as participation and past experiences in physical activities, and relationships between pupils and physical education teachers or friends, and (4) third factors such as parent-child relationship, mental and physical health, and environments for learning and physical activities (Figure 1). From the path analyses using elementary school pupils, it revealed that the third factors influenced the secondary ones, the secondary influenced the primary, and eventually the primary factors (expectancy and affect) determined the achievement motivation for learning in physical education. According to this model, the most critical determinants of the achievement motivation for learning are perceived expectancy and affect which the pupils experience during physical education class. They are expectancy of

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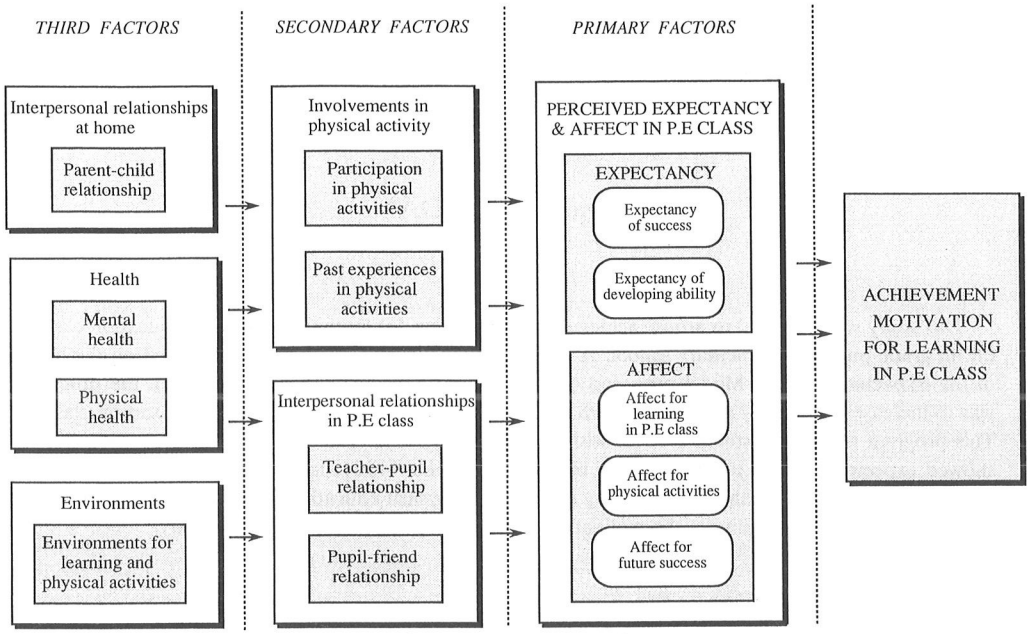

Figure 1. The Expectancy-Affected Model which determines achievement motivation for learning in physical education class (Nishida and Sawa, 1993)

success, expectancy of developing ability, affect for learning in physical education class, affect for physical activities, and affect for future success. It is therefore hypothesized that the achievement motivation for learning in physical education will be aroused if the pupil's expectancy and affect increase.

In previous studies, certain types of achievement motivation training have been carried out with pupils (Alschuler et al., 1971; Kolb, 1965; Shimoyama, 1981). Although the main concerns were with academic achievement, the results showed improved academic grades or increased general achievement motivation. Several attempts at motivation training were also carried out in physical education class (Halfon and Bronner, 1988; Man and Hondlik, 1984). The major findings showed shortened running times for 1,000 meters and better sports motivation. All of those studies suggested that achievement motivation training was applicable to educational situations. However, some problems persist for future studies. For example, because of no consistent theory or principles among the previous studies, a motivation training program with valid theory or principles is needed. It is also necessary to use various dependent variables because the motivation training program affects various aspects.

With this as a background, the purpose of this practical study was to create a motivation training program in physical education class on the basis of the Expectancy-Affect Model and to test the effectiveness of the program with various dependent variables.

METHOD

Subjects

Subjects were 5th grade pupils (11 boys and 12 girls) at an elementary school. Their chrono-

logical ages ranged from 10 to 11 years and they were all in good health.

Motivation program

An Achievement Motivation in Physical Education Program (AMPE program) was prepared for arousal of the pupil's achievement motivation for learning in physical education classes. The AMPE program was based on the Expectancy-Affect Model and was constructed according to the following main principles: (1) all pupils have a level of latent achievement motivation for learning in physical education, (2) the achievement motivation for learning in physical education can be increased through appropriate guidance or teaching, and (3) if both the expectancy and affect experienced in physical education class increase, the achievement motivation for learning in physical education will also increase.

The specific contents of the AMPE program were as follows: a physical education teacher helped the subjects recognize the importance of efforts, have a heightened interest in physical education, increase the probability of success through an adequate small-step method, understand learning strategy, set specific or realistic goals, experience success, attribute success or failure to effort, and feel enjoyment with friends of improved ability. It was also the essence of the program that the teacher praised the subjects when they succeeded or tried hard. All of the contents were focused on arousal of the expectancy and affect which the subjects would experience in physical education class (Table 1).

The subjects participated in the AMPE program carried out during the regular physical education class. The teaching material at that time was gymnastics (box horse). The administrator of the AMPE program was a male physical education teacher aged 30 years who teaches the subjects in physical education class. The teacher was trained for the program through discussion with the author. The AMPE program continued 8 times (45 min. for each lesson) during two months.

Table 1. Short summary of the AMPE program

Main learning tasks or activities	Key points for increasing expectancy and affect
Orientation (box horse) (1 time)	★ Recognizing importance of efforts (through teacher's experience of success) ★ Having a heightened interest in P.E. class (learning cards, attainable goal-setting)
Gymnastics (box horse) (6 times)	★ Understanding learning strategy (demonstration, key points of improved skills, slow motion by VTR, observation learning) ★ Setting specific or realistic goals (learning cards, individual difference) ★ Experiencing success (attainable learning task, feedback by VTR) ★ Increasing the probability of success (a small-step method, technical advice, body support, almost attainable learning task) ★ Using attribution adequately (success to ability, failure to lack of efforts) ★ Praising every time (success, trying hard, approval, social support)
Presentation (box horse) (1 time)	★ Feeling enjoyment with friends (success, improved ability, playing together)

Measurements

To verify the effectiveness or validity of the AMPE program, the following measurements were administered before (pre-test) and after (post-test) the AMPE program treatment.

Achievement motivation for learning in physical education class. The AMPET developed by Nishida (1987, 1988, 1989) was used for assessing the strength of achievement motivation for learning in physical education. The test was the self-report questionnaire consisting of seven 8-item subscales and an 8-item lie scale. The five subscales, learning strategy, overcoming obstacles, diligence and seriousness, competence of motor ability, and value of learning, are related to positive aspects of the achievement motivation for learning in physical education, or the tendency to achieve success. The two subscales of anxiety about stress-causing situations and failure anxiety are concerned with negative aspects of the achievement motivation, or the tendency to avoid failure. The subjects were asked to respond to all items of the AMPET by using 5-point Likert rating scales ranging from "strongly disagree" to "strongly agree." The score of the AMPET was defined as a sum of the answers to the 8-item subscales.

Expectancy and affect. The perceived expectancy and affect in physical education class was measured by a questionnaire which consists of the following five factors: expectancy of success, expectancy of developing physical ability, affect for learning in physical education, affect for physical activities, and affect for future success. These factors were based on the Expectancy-Affect Model. There were five items for each factor, respectively. The response to each item was a 5-point rating scale identical to the AMPET. The range of scores for each factor was between 5 and 25.

Enjoyment in physical education class. The subjects were asked to respond as to how satisfied they were in the present physical education class and how much they enjoyed the sessions. The responses were made on a 7-point rating scale ranging from "do not enjoy it at all" to "enjoy it very much." The score could range from 1 to 7.

Intrinsic motivation in physical education class. In this study, intrinsic motivation was defined as motivation in a situation where the subjects can select their behavior by free will. The measurement was administered by the following question: After the physical education class is over, your teacher told you that the physical education class will continue into the next period. You are free to attend the class or not. If you don't want to attend the class, there will be no punishment. How do you feel ? The answer was a 7-point rating scale ranging from "do not want to attend at all" to "really want to attend." The score was between 1 and 7.

Friendship in physical education class. Friendship in physical education class was measured by 10 questions concerning encouragement, help, praise, support, and cooperation. The subjects responded to each item using a 5-point Likert rating scale identical to the AMPET. The score could range from 10 to 50.

Learning activities in physical education class. The subjects had their learning activities in physical education class evaluated by the teacher. The rating questions, consisting of eight items, were related to learning strategy, effort to perform well, observance of the rules, listening to the advice of the teacher, exercising with enjoyment, cooperation with friends, asking questions about learning contents, and frequency of exercise, respectively. The teacher evaluated the learning activities for each subject along 5-point Likert rating scales. Scores could range from 8 to 40.

RESULTS

Achievement motivation for learning in physical education

Mean scores and standard deviations of the AMPET subscales in the pre and post-test are shown in Table 2. The table also shows the standard mean scores of the AMPET on the right. The scores were means of the subscales determined as criteria when the AMPET was standardized in Japan (Nishida, 1989). Figure 2 shows the changes in the mean scores of each subscale. For comparison between pre and post-test scores, a t-test was applied to the data.

There was no significant difference for all subscales of the AMPET between any of the pre-test scores and the standard mean scores. The results indicate that the subjects' achievement

Table 2. Comparison between pre and post-test scores of the AMPET subscales

AMPET Subscale	Pre-test M	Pre-test S.D	Post-test M	Post-test S.D	t value	Standard mean score in Japan
Learning strategy	27.39	5.10	32.17	5.79	-5.43***	27.52
Overcoming obstacles	27.26	5.51	29.86	5.95	-2.93**	27.48
Diligence and seriousness	29.21	4.38	30.21	5.04	-0.94	28.63
Competence of motor ability	22.69	7.02	24.73	8.20	-2.89**	23.66
Value of learning	29.60	6.38	30.86	7.51	-1.64	29.67
Anxiety about stress-causing situations	24.60	7.31	22.17	9.04	1.78	23.34
Failure anxiety	21.78	6.61	20.04	7.77	1.54	21.88

*** p<.001, ** p<.01

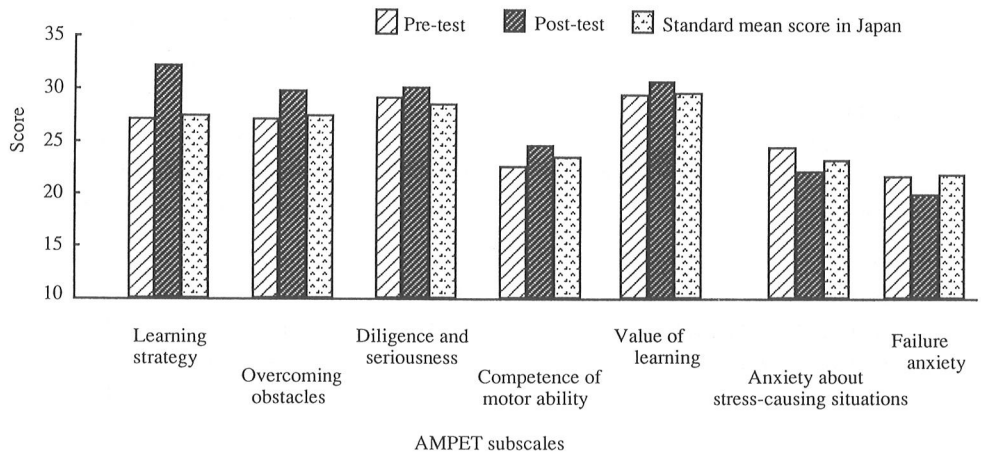

Figure 2. Change in mean scores of the AMPET subscales

motivation for learning in physical education class before the AMPE program treatment was average and almost the same as the standard.

In the post-test session, however, the means on the positive aspects of the AMPET (learning strategy, overcoming obstacles, diligence and seriousness, competence of motor ability, and value of learning) increased, while the mean scores on the negative aspects (anxiety about stress-causing situations and failure anxiety) decreased. The means of learning strategy, overcoming obstacles, and competence of motor ability were significantly higher than those in the pre-test session (learning strategy, $t=-5.43$; $p<.001$, overcoming obstacles, $t=-2.93$; $p<.01$, competence of motor ability, $t=-2.89$; $p<.01$).

Expectancy and affect

Means, standard deviations and t values concerning the expectancy and affect scores in the pre and post-test are shown in Table 3. Most of those scores increased significantly from the pre-test to the post-test session (expectancy of developing physical ability, $t=-3.59$; $p<.01$, expectancy total score, $t=-3.92$; $p<.01$, affect for learning in physical education, $t=-2.57$; $p<.01$, affect for physical activities, $t=-3.62$; $p<.01$, affect for future success, $t=-2.35$; $p<.05$, affect total score, $t=-4.07$; $p<.001$).

Enjoyment in physical education class

The score of enjoyment in physical education class showed a tendency to increase in the post-test. However, the difference in the score between two tests was not statistically significant (Table 4).

Intrinsic motivation in physical education class

The mean score of the pupils' intrinsic motivation in physical education classes in the post-test was significantly higher than the score in the pre-test (Table 4).

Friendship in physical education class

The mean of the friendship in physical education class in the pre-test was 36.47 and the score in the post-test was 37.61. The difference was statistically significant (Table 4).

Learning activities in physical education class

In the pre and post-test session, the mean

Table 3. Comparison between pre and post-test scores of the expectancy and affect

Variables	Pre-test M	Pre-test S.D	Post-test M	Post-test S.D	t value
Expectancy					
Expectancy of success	17.04	4.40	18.00	4.36	-2.04
Expectancy of developing physical ability	18.56	3.21	20.04	3.64	-3.59**
Total score	35.60	7.22	38.04	7.85	-3.92**
Affect					
Affect for learning in physical education	19.52	4.51	20.73	5.26	-2.57**
Affect for physical activities	19.43	4.59	21.13	4.71	-3.62**
Affect for future success	22.08	3.94	23.08	3.11	-2.35*
Total score	61.04	11.83	64.95	12.42	-4.07***

*** p<.001, ** p<.01, * p<.05

Table 4. Comparison between pre and post-test scores of the several variables in physical education class

Variables	Pre-test		Post-test		t value
	M	S.D	M	S.D	
Enjoyment	5.52	1.54	5.69	1.74	-0.72
Intrinsic motivation	5.13	1.60	5.57	1.92	-2.10*
Friendship	36.47	7.34	37.61	8.15	-2.10*
Learning activities	24.65	5.32	27.43	6.25	-4.69***

*** p<.001, * p<.05

score of the learning activities in physical education class evaluated by the physical education teacher was 24.65 and 27.43, respectively. The difference between the two tests was significant (Table 4).

DISCUSSION

In this study, the AMPE program based on the Expectancy-Affect model was applied to 5th grade pupils during the regular gymnastics lesson. The program was focused on arousal of the expectancy and affect that the pupils would experience in the physical education class.

On this point, the expectancy and affect scores increased obviously from the pre-test to the post-test session. This result indicates that the subject's expectancy and affect were increased by the AMPE program, and also suggests that the physical education teacher was able to administer the program appropriately. During the program treatment, the teacher pointed out to the subjects the importance of effort, understanding of learning strategy, realistic goal-setting, experience of success, adequate use of attribution, and so forth. He also praised the subjects every time they succeeded or tried hard. Such teaching or guidance could bring about increments of the subject's expectancy and affect. It was evident therefore, that the AMPE program constructed in this study increased the subject's expectancy and affect.

In view of the data presented in this study, the most important findings were that the AMPE program had a great influence on the other dependent variables. That is, the scores of all variables were higher in the post-test than in the pre-test session, which indicated that the APME program aroused achievement motivation for learning in physical education classes, heightened the enjoyment and the intrinsic motivation, helped the subjects maintain good friendships, and activated the learning activities. These results supported the validity of the AMPE program based on the Expectancy-Affect model, and also suggested that the arousal of the expectancy and affect was effective in order to increase the achievement motivation for learning and activate the pupil's learning activities in physical education class.

In this practical study, the expectancy was defined as the state of expecting success for

learning tasks in physical education class. The affect meant feelings of positive emotion such as pleasure, enjoyment, and pride of success. The concept of expectancy and affect was almost identical to that of Atkinson's Expectancy-Value Model (1957) and Attribution Theory (Weiner, 1974). One of the reasons that arousal of the expectancy and affect increased the achievement motivation for learning in physical education would be due to the fact that the expectancy and affect used in this study were almost the same as the principal components of such cognitive motivation theory. It is concluded, therefore, that the arousal of the pupil's expectancy and affect was critically important for the enhancement of the achievement motivation for learning and activation of the pupil's learning activities in physical education classes.

Some problems, however, remain to be proved in future investigations. For example, there were no control groups for comparison with the AMPE program group (experimental group) in this study. It is also necessary for further understanding of the effects of the AMPE program to examine the contents of the teacher's speaking and behaviors in detail. However, judging from what has been mentioned above, it seems reasonable to conclude that this study, which aimed to arouse achievement motivation for learning in physical education class, supplied important data and useful information to physical education teachers.

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