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## The evaluation of the effectiveness in the physical education lessons under the orientation of differentiated classroom at Thai Nguyen University of education

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### Abstract

Organizing physical education (PE) lessons in the orientation of differentiation helps the learners participate in learning activities with suitable content and form for individual characteristics. The initial effectiveness of the PE activities for students in the orientation of differentiated classrooms at Thai Nguyen University of Education was assessed by interviews, pedagogical observations, pedagogical tests and experiments. Assessment criteria include general level of fitness, professional qualifications and students' perceptions.

**Keywords:** Educational differentiation, physical education, individual characteristics, evaluation

### 1. Introduction

Organizing lessons according to the view of differentiation aims at meeting the learners' differences in competencies, qualifications, interests... as well as the conditions of the educational institutions to choose the appropriate educational contents, forms and methods. In physical education (P.E), the view of differentiation needs to be expressed more clearly than any other learning fields. The basis for organizing the P.E activities in the orientation of differentiation is to classify the health and the level of the learners combined with the choice of content and form of exercise <sup>[1, 4, 5, 6]</sup>.

The results of the Previous research (Journal of Sports Training and Coaching, No. 2/2019, Bac Ninh University of Sports and Physical Education, pp. 24 - 29) showed that through the physical activities at Thai Nguyen University of Education, there are always differences in learners' qualifications which are reflected in physical abilities, learning results and health status. However, the view of differentiation is still rarely applied by teachers in the P.E class. Through theoretical and practical research as well as consultation with experienced lecturers, the author proposes measures to organize P.E lessons in the orientation of differentiation approach. The measures are then applied experimentally in P.E lessons for students of Thai Nguyen University of Education (experimentally) to evaluate practical effectiveness <sup>[2]</sup>.

### 2. Research methods

In the research process, the researchers used the following research methods: Pedagogical Experiment; Pedagogical Observation; Pedagogical Test; Seminar Interview; Mathematical statistics.

### 3. Findings and Discussion

#### 3.1 Description of measures

Differentiation in education has many different forms and levels. This research only studies and proposes specific measures so that teachers can apply to organize P.E activities in the orientation of differentiation approach within the class they are in charge of.

**Measure 1:** Increase students' education about health and sports

1. **Purpose:** Raising students' awareness of health and sports practice.

2. Content: Equipping and updating students with new and basic knowledge about health and sports practice.
3. Methods: Setting up content to foster students' knowledge in the in-class lessons; Providing documents, introducing information sources for students to self-study; Check and evaluate results.

**Measure 2:** Divide the group according to learners' characteristics.

1. Purpose: Having suitable teaching content and form to the characteristics of each group.
2. Content: The class can be divided into 3 basic groups (advanced group, basic group and weak group) or more, thereby defining the training task for each group.
3. Methods: Having a test at the beginning of the semester to classify the levels and then combine with exchanges and talks with students to divide classes into groups with similar characteristics; develop regular assessments for each group.

**Measure 3:** Build a contingent of staff or teaching assistants

1. Purpose: Helping the instructors operate practice activities in each group; Improve sports skills for staffs and students majoring in physical education.
2. Content: Selecting students having talents in sports or students majoring in P.E to be staffs or teaching assistants.
3. Methods: Selecting students with sports talents and then foster their basic skills and techniques in organizing practice activities. It is possible to use students majoring in Physical Education as teaching assistants. During the lessons, the instructors will provide general guidance and assign tasks to groups, and then teaching assistants help each group practice. Teaching assistants can help their team with extracurricular practice.

**Measure 4:** Diversify the forms of practice

1. Purpose: Having a suitable form of practice for each group, improving students' excitement.
2. Content: Having different forms of practice for each group in the same lesson combined with extracurricular activities.
3. Methods: Developing different contents and forms of practice for each group during lessons; Organizing interaction activities between classes which are having the P.E modules; Students in advanced groups can join sports clubs instead of regular lessons (under teachers' controll); Organizing extracurricular activities outside the school.

**Measure 5:** Strengthen counseling and support students

1. Purpose: Helping the students choose suitable contents and practice forms during both regular and extra-curricular lessons.
2. Content: Lecturers advise and support students to improve their health through sports activities in many different ways. Students receive timely advice and support to choose the suitable sports, methods, forms, and places to practice.
3. Methods: Putting consulted and supported contents into the teaching plan; Develop communication methods to promptly advise and support students.

The methods are applied experimentally for students of Aerobic class N02 (n = 45 female students). Control class is

Aerobic class N03 (n = 43 female students). Control class (N03) still learn in the usual way. The research conducted to analyze and compare the results of the two classes at the beginning and end of the semester. The selected evaluation criteria by include: General physical fitness level, technique and students' self-assessment.

### 3.2 The results of pre-experimental evaluation

Because the Aerobic module was a new content, at the beginning of the semester (before carrying out the experiment), the researcher only assessed and compared the general fitness level of the experimental group (EG) and the control group (CG). The results are shown in Table 1 and Table 2 [3].

**Table 1:** The Comparison of the overall fitness indexes between the experimental group and the control group at the pre-experiment stage

Content	Average achievement ( $\bar{X} \pm \delta$ )		t Stat	t Critical two tail	P
	EG (n = 45)	CG (n = 43)			
Long jump (cm)	166.27 ± 11.90	168.12 ± 12.00	0.73	1.99	0.05
Run 30m (s)	6.12 ± 0.50	6.17 ± 0.48	0.46	1.99	0.05
Run 4x10m (s)	12.55 ± 0.60	12.56 ± 0.63	0.03	1.99	0.05
Run 5 phút (m)	850.89 ± 62.18	853.60 ± 61.90	0.20	1.99	0.05

- The results of comparing each index to assess the general fitness level at pre- experiment stage show that the initial test results of the EG and the CG have no significant differences. The comparison results have  $|t \text{ Stat}| < t \text{ Critical two tail}$  (P 0.05) in all 4 tested indexes.

**Table 2:** The comparison of fitness rankings of experimental group and control group at pre-experimental stage

Group	EG (n = 45)		CG (n = 43)		The result of CHITEST Function
	Number	%	Number	%	
Fail	19	42.22%	19	44.19%	P = 0.85 (P > 0.05)
Pass	21	46.67%	17	39.53%	
Good	5	11.11%	7	16.28%	

**Note:** The CHITEST Function is used to compare the rate of "Fail" and "Pass". "Good" is included in "Pass" group

1. Synthesizing the results of ranking the general fitness level at the pre- experiment stage of the control and experiment groups shows that the difference in the rate of physical fitness level between the two groups was not significant. The experiment group has 11.11% of whom got "good" result, 46.67% got "pass" and 42.22% got "fail". The control group has 16.28% of the students who achieved "good" result, 39.53% passed and 44.19% failed.
2. The grading results show that there are still quite a few students who did not achieve the general fitness level as prescribed (42.22% to 44.19%). Using the CHITEST function to compare the rate of "fail" of the experiment group with the control groups provided the results of P = 0.85 (if P > 0.05, there is no difference in the rate between the 2 groups).

**In summary:** By comparing the test results of each index and comparing the ranking rates, it shows that the general fitness level at pre - experiment stage of the control group and the experiment group is similar.

### 3.3 The results of post-experimental evaluation (At the end of the semester)

After 2 months of applying the test, the research tested,

compared the general fitness level and the results of the tests as well as surveyed the students' opinions. From there, the researcher made an assessment of the effectiveness of the measures.

### 3.3.1 General fitness level

The results of the test on general fitness level at the post-experiment stage shows that both the experiment group and the control group have a positive development in the average achievement of each test and the ranking rate. However, the results achieved by the experiment group are clearly higher than that of the control group. Specific results are summarized and compared in Table 3 and Table 4.

**Table 3:** The comparison of the fitness indexes of experiment group and control group at the post-experiment stage

Content	Average Achievement ( $\bar{X} \pm \delta$ )		t Stat	t Critical two tail	P
	EG (n = 45)	CG (n = 43)			
Long jump (cm)	177.44 ± 10.48	171.02 ± 11.29	2.76	1.99	0.05
Run 30m (s)	5.89 ± 0.36	6.10 ± 0.43	2.42	1.99	0.05
Run 4x10m (s)	12.12 ± 0.38	12.36 ± 0.56	2.37	1.99	0.05
Run 5 phút (m)	908.67 ± 41.37	875.81 ± 44.57	3.58	1.99	0.05

The summary of test results in Table 3 shows that: After 2 months of study, the achievement of each test to measure the general fitness level for both EG and CG improved. However, the results of the EG were better than the CG in all 4 contents of the tests. The comparison results have  $|t \text{ Stat}| > t \text{ Critical two tail}$  (P 0.05).

**Table 4:** The comparison of the ranking rates of fitness level between the EG and CG at post-experiment stage

Group	EG (n = 45)		CG (n = 43)		The result of Chitest Function
	Number	%	Number	%	
Fail	5	11.11%	13	30.23%	P = 0.03 (P < 0.05)
Pass	26	57.78%	22	51.16%	
Good	14	31.11%	8	18.60%	

**Note:** The CHITEST Function is used to compare the rate of "Fail" and "Pass". "Good" is included in "Pass" group

The results for the ranking of the overall fitness level are similar. Both groups have improved, but it is clearly shown that the EG has better results than the CG (Table 4).

1. In the EG, 31.11% of the students achieved the "good"

**Table 6:** The summary of the opinions from experiment group (n = 45) and control groups (n = 43) about the subject

No	Opinions on the subject	Group	Agree		Partly agree		Disagree	
			No	%	No	%	No	%
1	Understand individual characteristics in physical activity	EG	41	91.11%	4	8.89%	0	0%
		CG	20	46.51%	10	23.26%	13	30.23%
2	Suitable learning requirements and tasks for students	EG	40	88.89%	5	11.11%	0	0%
		CG	18	41.86%	11	25.58%	14	32.56%
3	Diversified and flexible contents and methods of learning in accordance with reality	EG	43	95.56%	2	4.44%	0	0%
		CG	18	41.86%	15	34.88%	10	23.26%
4	Students are equipped with basic knowledge of sports and aerobic	EG	42	93.33%	3	6.67%	0	0%
		CG	40	93.02%	3	6.98%	0	0%
5	Get to know more of learning resources and know how to practice overtime on their own.	EG	42	93.33%	3	6.67%	0	0%
		CG	12	27.91%	12	27.91%	19	44.19%
6	Satisfied with the learning contents and methods	EG	43	95.56%	2	4.44%	0	0%
		CG	18	41.86%	9	20.93%	16	37.21%
7	Enjoy and be active in the activities of the subject	EG	41	91.11%	4	8.89%	0	0%
		CG	15	34.88%	11	25.58%	17	39.53%

After each course, besides the knowledge and skills that learners are equipped with, the student's satisfaction and interest is also a factor to evaluate the success of the course.

result compared with 18.60% "good" of the CG; The rate of students who "passed" is nearly equal. The EG has 57.78% of and the CG has 51.16%.

2. In the rate of "failed" students, the EG has only 11.11% of the students who "failed" compared with the CG with 30.23% of the "failed" students in the general fitness level according to the standards of the Ministry of Education and Training (Article 16, chapter IV, Regulations on the evaluation and grading of student's physical strength). The results of the comparison show that the rate of "failed" students in the CG is clearly higher than that of the EG (Using CHITEST to compare results P = 0.03).

### 3.3.2 The results of the tests

We use the results of students' test 1 and test 2 (in the scale of 10) according to the curriculum to compare and evaluate. The results are summarized in Table 5 provided by lecturers directly teaching experiment class and control class [3].

**Table 5:** The comparison of the results of the professional test between EG and CG at the post - experiment stage

Content	Average grading ( $\bar{X} \pm \delta$ )		t Stat	t Critical two tail	P
	EG (n = 45)	CG (n = 43)			
Test 1	7.71 ± 0.98	6.79 ± 1.14	4.05	1.99	0.05
Test 2	7.93 ± 0.86	6.94 ± 0.93	5.20	1.99	0.05

The average grading of test 1 and test 2 of the EG were 7.71 ± 0.98 and 7.93 ± 0.86 respectively compared with 6.79 ± 1.14 and 6.94 ± 0.93 of the CG. Comparing the average grading on each test between the two groups results in  $|t \text{ Stat}| = 4.05$  and  $5.20 > t \text{ Critical two tail} = 1.99$ . This result shows that in both tests, the EG has significantly higher grading than the CG (P 0.05).

### 3.3.3 Students' opinions after the course

The survey questionnaires on the students' opinions about the subject is done at the end of the semester on the following contents: Comments on requirements, tasks, contents and learning methods; equipped knowledge and skills; Satisfaction and interest. (Table 6).

In this respect, the P.E activities in the orientation of classroom differentiation have achieved positive results. This is shown through the students' survey after the experimental

course.

1. 91.11% of the students in experiment group said that the Physical Education in the orientation of differentiation helps them "understand individual characteristics in sports activities"; The control group has only 46.51%.
2. Requirements, tasks, content and learning methods: 88.89% and 95.56% of the students in experiment group said it was "diverse, flexible, suitable for students and practice", while the control group only has 46.86% for the same opinions. Up to 32.56% and 23.26% of students in the control group said that the learning content, requirements and methods were "not yet diverse, flexible, suitable" for students and practice.
3. Organizing the P.E activities in the orientation of the classroom differentiation helps students access more sources of sports knowledge and "know how to practice by themselves". Up to 93.33% of the students from experiment group "agree" with this statement while the general group has 27.91%; Up to 44.19% of the control students "disagree", which means that they have not been equipped with self-training methods.
4. Up to 95.56% and 91.11% of the students in experiment group "satisfy, love and have active attitudes" towards the contents and learning methods, while the control group only has 41.86% and 34.88%.
5. The only content received similar evaluation between the experiment group and the control group is "equipped with basic knowledge about sports and aerobic". There are 93.03% of students in the experiment group and 93.02% of students in the control group who "agreed" with this statement.

#### 4. Conclusion

P.E activities for students in the orientation of classroom differentiation have been piloted at Thai Nguyen University of Education. The experiment group is Aerobic class N02 (45 female students) and the control group is Aerobic class N03 (43 female students). The initial achievements are relatively positive.

1. The general fitness level of the experiment group has a better development than the control group in both the average results of each test content and the ranking rate of the fitness level according to the regulations of the Ministry of Education and Training.
2. The professional knowledge and skills after the experiment of the experiment group is also higher than that of the control group, which is shown in the test results of Aerobic 1 and Aerobic 2 according to the curriculum.
3. P.E activities organized in the orientation of classroom differentiation have received positive reviews from students. Students have better understanding of their own characteristics in sports activities. Content, requirements, learning methods are suitable for students and practical conditions. Thereby, students feel satisfied, love and positive, proactive with P.E activities.

The differentiation in education is not a new perspective, but for the first time, it is applied in the P.E activities at Thai Nguyen University of Education. The results and experience gained from the experiment program are an important practical basis for expanding to other classes.

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