



THE CURRENT SITUATION OF SELF-DISCIPLINE AND ACTIVE PARTICIPATION IN MATHEMATICS LESSONS AMONG STUDENTS AT OLYMPIC SPORT GIFTED SCHOOL, BAC NINH SPORT UNIVERSITY OF VIETNAM

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Abstract:

Using conventional scientific research methods in the field of physical education and sports, this paper identifies 16 criteria to assess the current state of self-discipline and active participation in mathematics lessons among students at the Olympic Sport Gifted School, Bac Ninh Sport University of Vietnam. This assessment is based on learning emotions, concentration and attention, willpower and effort, and behavior. The results serve as a basis for proposing proper measures to improve the quality of mathematics teaching for students at the Olympic Sport Gifted School.

Keywords: current situation; self-discipline and active participation; mathematics lessons; students; Olympic Sport Gifted School

1. Introduction

Among the fields of science and technology, mathematics has always held a prominent position. It is an intellectual sport that helps us cultivate logical thinking methodologies, techniques, skills, and creative intelligence. Mathematics can be considered a challenging subject. Furthermore, the content of mathematics is rich and interdisciplinary. Therefore, to achieve high efficiency in the teaching and learning process, teachers need to seek pedagogical measures appropriate to the specific characteristics of the subject.

A practical survey of mathematics teaching at the Olympic Sport Gifted School reveals that many students, who are also athletes in various sports, show limited capacity in problem detection and problem-solving. They often commit errors in knowledge and application methods, and in particular, they lack genuine self-discipline and active

participation in their learning. Specifically, they do not clearly perceive the role and utility of the subject and show no interest in the lessons. They are not fully focused or attentive during learning, with some students taking part merely to cope. They display a lack of effort, resulting in low academic performance. Although various traditional and modern teaching methods have been implemented in practice, they have not yet successfully fostered students' active participation, initiative, and creativity, leaving students passive in acquiring scientific knowledge.

Based on the aforementioned analysis, assessing the current state of self-discipline and active participation in mathematics lessons among students at the Olympic Sport Gifted School is both necessary and urgent.

2. Research Method

This study uses four conventional scientific research methods, including:

- **Document analysis and synthesis method:** To evaluate background information and establish theoretical frameworks.
- **Interview and discussion method:** To extract direct feedback from students and educators regarding the subject.
- **Pedagogical observation method:** To systematically record behaviors and emotions during active mathematics classes.
- **Mathematical statistics method:** To process survey results and academic scores (Cronbach's Alpha, Mean, and CV).

3. Research Results and Discussion

3.1. Selection of criteria to assess self-discipline and active participation in mathematics lessons of students at the Olympic Sport Gifted School

This study constructed evaluation criteria to assess the self-discipline and active participation in mathematics lessons of students at the Olympic Sport Gifted School through a questionnaire. These criteria reflect: learning emotions; concentration and attention; willpower and effort; behaviors; and cognitive outcomes.

Through the analysis and synthesis of relevant literature, the study systematized 16 survey items categorized according to students' manifestations. After identifying the criteria for evaluating self-discipline and active participation in mathematics lessons, a questionnaire using a 5-point Likert scale was developed, and its reliability was tested using Cronbach's Alpha. The interview results are presented in Table 1.

Table 1: Interview results on the criteria to assess self-discipline and active participation in mathematics lessons of students at the Olympic Sport Gifted School (n=33)

No.	Evaluation Criteria	Scale Value					Total Score	Mean Score	Cronbach's Alpha
		1	2	3	4	5			
I. Manifestations of Learning Emotions									
1	Students' attitude towards the subject.	0	0	9	28	115	152	4.61	.883
2	Students' emotions regarding subject outcomes.	0	0	9	40	100	149	4.52	.885
II. Manifestations of Concentration and Attention									
3	Actively listening to the teacher's lecture.	0	0	6	28	120	154	4.67	.877
4	Paying attention to sample mathematical models and practical situations introduced by the teacher.	0	0	15	28	105	148	4.48	.879
III. Manifestations of Willpower and Effort									
5	Attempting to complete classroom exercises assigned by the teacher.	0	0	6	40	105	151	4.58	.882
6	Actively taking part in extracurricular learning.	0	0	6	40	105	151	4.58	.879
IV. Behavioral Manifestations									
7	Not skipping mathematics classes.	0	0	6	40	105	151	4.58	.877
8	Arriving at class on time.	0	0	18	24	105	147	4.45	.876
9	Taking complete notes during class.	0	0	18	48	75	141	4.27	.867
10	Seriously performing assigned tasks, actively contributing to class discussion...	0	0	6	36	110	152	4.61	.876
11	Actively asking the teacher about the lesson.	0	0	9	40	100	149	4.52	.877
12	Enthusiastically helping peers during lessons.	0	0	9	40	100	149	4.52	.875
13	Allocating time for the subject.	0	0	15	48	80	143	4.33	.876
14	Proactively reviewing lessons before and after class.	0	0	18	48	75	141	4.27	.867
V. Manifestations in Cognitive Outcomes									
15	Academic performance in mathematics.	0	0	18	24	105	147	4.45	.872
16	Relating mathematical problems to physical education and sports practice.	0	0	15	48	80	143	4.33	.876

The results in Table 1 show that all 16 items, categorized into 5 expression groups, received high consensus from the respondents, with mean scores ranging from 4.27 to 4.67 points. Following the statistical verification and the exclusion of observed variables with corrected item-total correlations below 0.3, as well as checking that the reliability coefficients of the scales were greater than 0.6, all proposed criteria were determined to be statistically significant. Cronbach's alpha coefficients ranged from 0.867 to 0.885, confirming that the variables correlate appropriately with the dependent factors and are suitable for inclusion in the study. These findings serve as the foundation for developing measures to enhance student self-discipline and active participation in mathematics lessons.

3.2. The current situation of self-discipline and active participation in mathematics lessons of students at the Olympic Sport Gifted School

3.2.1. Current situation of self-discipline and active participation manifested in learning emotions

To investigate the manifestations of learning emotions among students at the Olympic Sport Gifted School during mathematics lessons, a survey was conducted with 162

students using Criteria 1 and 2, which included 4 questions, each offering 3 response options. The detailed interview results are presented in Table 2:

Table 2. Interview results on learning emotions in mathematics lessons of students at the Olympic Sport Gifted School (n=162)

No.	Interview Content	Response Option	Quantity	Percentage (%)	Rank
1	Do you like learning mathematics?	Like	46	28.40	3
		Normal	60	37.04	1
		Dislike	56	34.57	2
2	How do you perceive the necessity of mathematics?	Necessary	56	34.57	3
		Normal	68	41.98	1
		Unnecessary	38	23.46	2
3	What is your emotion when you pass a mathematics exam?	Happy	80	49.38	2
		Normal	82	50.62	1
		Unhappy	0	0.00	3
4	What is your emotion when your mathematics exam result is low?	Sad	60	37.04	2
		Normal	76	46.91	1
		Not sad	26	16.05	3

The results in Table 2 show that the proportion of students choosing the "Normal" response option is high. This implies that the majority of students express rather superficial emotions towards mathematics.

3.2.2. Current situation of self-discipline and active participation manifested in concentration and attention

The interview results evaluating students' concentration and attention during mathematics lessons at the Olympic Sport Gifted School are presented in Table 3.

response option remains high. Consequently, it can be concluded that superficial emotions lead to inactive behaviors, and many students are not genuinely focused or attentive during lessons.

Table 3: Interview results on student concentration and attention in mathematics lessons of students at the Olympic Sport Gifted School (n=162)

No.	Interview Content	Response Option	Quantity	Percentage (%)	Rank
1	During mathematics lessons, do you pay attention to the teacher's lecture?	Pay attention	36	22.22	3
		Normal	65	40.12	1
		Do not pay attention	61	37.65	2
2	During mathematics lessons, do you pay attention to the sample mathematical models introduced by the teacher?	Pay attention	41	25.31	3
		Normal	65	40.12	1
		Do not pay attention	56	34.57	2

3.2.3. Current situation of self-discipline and active participation manifested in willpower and effort

The interview results evaluating students' willpower and effort during mathematics lessons at the Olympic Sport Gifted School are presented in Table 4:

Table 4: Interview results on the manifestations of willpower and effort in mathematics lessons of students at the Olympic Sport Gifted School (n=162)

No.	Interview Content	Response Option	Quantity	Percentage (%)	Rank
1	Do you like learning mathematics?	Like	46	28.40	3
		Normal	60	37.04	1
		Dislike	56	34.57	2
2	How do you perceive the necessity of mathematics?	Necessary	56	34.57	3
		Normal	68	41.98	1
		Unnecessary	38	23.46	2
3	What is your emotion when you pass a mathematics exam?	Happy	82	50.62	2
		Normal	64	39.51	1
		Unhappy	16	9.88	3
4	What is your emotion when you do not pass a mathematics exam?	Sad	60	37.04	2
		Normal	76	46.91	1
		Not sad	26	16.05	3
5	During mathematics lessons, do you pay attention to the teacher's lecture?	Pay attention	36	22.22	3
		Normal	65	40.12	1
		Do not pay attention	61	37.65	2
6	During mathematics lessons, do you pay attention to the sample mathematical models introduced by the teacher?	Pay attention	41	25.31	3
		Normal	65	40.12	1
		Do not pay attention	56	34.57	2
7	During mathematics lessons, do you attempt to complete exercises assigned by the teacher in class?	Attempt	37	22.84	3
		Normal	72	44.44	1
		Do not attempt	53	32.72	2
8	Do you regularly take part in extracurricular learning?	Regularly	56	34.57	3
		Occasionally	74	45.68	2
		Do not take part	79	48.77	1
9	Have you missed any mathematics classes?	No	32	19.75	3
		1 – 3 sessions	78	48.15	1
		More than 3 sessions	52	32.10	2
10	Do you often arrive late to class?	No	55	33.95	3
		1 – 3 sessions	83	51.23	1
		More than 3 sessions	58	35.80	2
11	Do you proactively take part in constructing lessons?	Eagerly	36	22.22	3
		Normal	66	40.74	1
		Not eagerly	60	37.04	2
12	Do you take complete notes?	Regularly	63	38.89	1
		Occasionally	58	35.80	2
		Never	41	25.31	3
13	Do you engage in personal matters during class?	Regularly	34	20.99	3
		Occasionally	60	37.04	2
		Never	68	41.98	1
14	Are you diligent in asking the teacher about lessons?	Regularly	32	19.75	3
		Occasionally	53	32.72	2
		Never	77	47.53	1
15	Do you debate with peers during mathematics lessons?	Regularly	32	19.75	3
		Occasionally	53	32.72	2
		Never	83	51.23	1
16	Do you consult relevant subject-related documents?	Regularly	32	19.75	3
		Occasionally	47	29.01	2
		Never	83	51.23	1
17		Regularly	61	37.65	2

	Do you proactively review lessons before and after class?	Occasionally	63	38.89	1
		Never	38	23.46	3

The results in Table 4 show that the percentage of students absent from class remains high, a significant number of students arrive late, and the percentage of students who are enthusiastic when assigned tasks or who diligently ask the teacher about lessons remains low.

To evaluate the manifestations of students' cognitive outcomes during mathematics lessons at the Olympic Sport Gifted School, we conducted a statistical analysis of the final second-semester examination scores for the academic year 2023–2024 of 162 students. The academic performance in mathematics is presented in Table 5:

Table 5: Examination results in mathematics of students at the Olympic Sport Gifted School (n=162)

Evaluation Category	Statistical Parameters			Exam Classifications							
	Mean (x)	Std. Dev. (S)	CV (%)	Excellent - Outstanding		Good		Average		Weak - Poor	
				Quantity	%	Quantity	%	Quantity	%	Quantity	%
Exam Score	6.92	0.78	11.27	19	11.72	61	37.65	59	36.42	23	14.20

An analysis of the results in Table 5 shows that the mean exam score ($\bar{x}$) of the students is low and heterogeneous ($CV > 10\%$). The number of students achieving excellent or outstanding ratings is modest, while the proportion of students classified as average, weak, or poor remains high.

The percentage of each grade category in the mathematics exam is also illustrated in Chart 1.

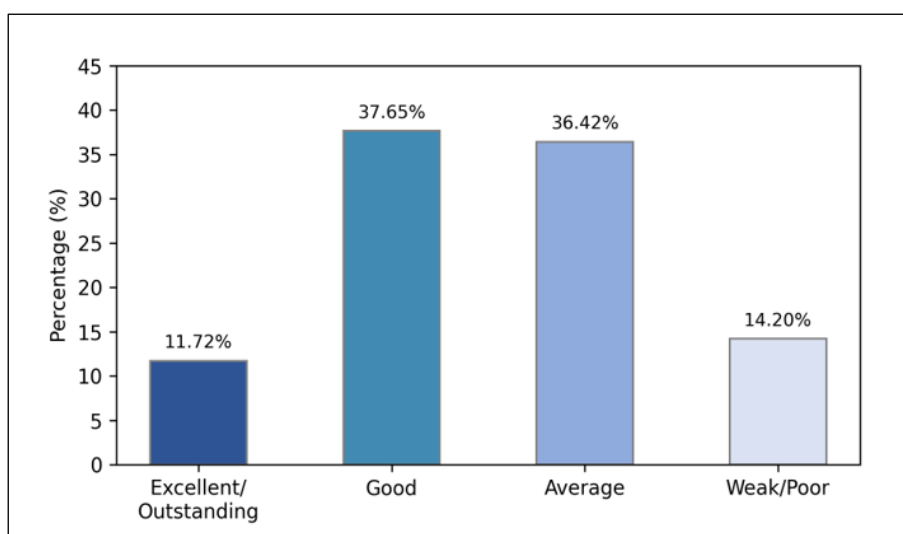


Chart 1: Percentage of mathematics examination grade categories

To ensure greater objectivity, we proceeded to interview mathematics teachers regarding student manifestations during class. The interview results are presented in Table 6:

Table 6. Teacher interview results regarding the self-discipline and active participation of students in mathematics lessons at the Olympic Sport Gifted School (n=6)

No.	Interview Content	Interview Results					
		Agree		Undecided		Disagree	
		Quantity	%	Quantity	%	Quantity	%
1	Students are aware of the necessity of the subject.	1	16.67	3	50.00	2	33.33
2	Most students like learning mathematics.	1	16.67	3	50.00	2	33.33
3	Frequently pay attention to the teacher's lectures.	1	16.67	3	50.00	2	33.33
4	Pay attention to the sample mathematical models introduced by the teacher.	0	0.00	3	50.00	3	50.00
5	Always try to complete exercises assigned by the teacher in class.	1	16.67	3	50.00	2	33.33
6	Actively participate in extracurricular learning.	0	0.00	4	66.67	2	33.33
7	Do not skip mathematics classes.	1	16.67	3	50.00	2	33.33
8	Frequently arrive and leave class on time.	0	0.00	3	50.00	3	50.00
9	Take complete notes.	1	16.67	3	50.00	2	33.33
10	Proactively volunteer to construct lessons.	1	16.67	3	50.00	2	33.33
11	Do not engage in personal matters during class.	1	16.67	3	50.00	2	33.33
12	Diligently ask the teacher about unresolved issues.	1	16.67	3	50.00	2	33.33
13	Proactively debate with peers during lessons.	1	16.67	3	50.00	2	33.33
14	Proactively review lessons before and after class.	1	16.67	3	50.00	2	33.33
15	Consult subject-related documents.	1	16.67	3	50.00	2	33.33

Table 6 reveals that the interview results of the teachers align closely with those of the students. When surveyed, the teachers reported that many students do not actively listen to lectures, pay little attention to sample models introduced by teachers, neglect note-taking and classroom exercises, fail to proactively contribute to constructing lessons, and lack self-discipline and active participation in their learning. Consequently, there is an urgent need to formulate measures to activate learning activities for students.

4. Conclusion

In conclusion, this research has established 16 criteria to evaluate students' self-discipline and active participation in mathematics lessons. Based on these criteria, the study assessed the current situation and revealed substantial limitations in both regular and extracurricular classes, manifested across learning emotions, concentration and attention,

willpower and effort, as well as behavior. These findings will serve as a basis for exploring the root causes and proposing strategic pedagogical interventions to enhance self-discipline and active participation in mathematics lessons among students at the Olympic Sport Gifted School.

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Conflict of Interest Statement

There is no conflict of interest.

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