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**CURRENT SITUATION IN THE LEVEL AND EFFICIENCY  
OF USING NATURAL SCIENCE SUBJECT TEACHING METHODS BY MEANS  
OF EXPERIENCE METHODS AT SECONDARY SCHOOLS  
IN HO CHI MINH CITY, VIETNAM**

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**Abstract.** In the orientation of innovating education in general and teaching of Natural Science in particular, educators determined that organizing teaching by experience method is the main way to realize goals of capacity development for students. The paper presents the research results on the awareness of teachers and students, the level and effectiveness of using Natural Science teaching methods according to the experience method in some secondary school in Ho Chi Minh City, Vietnam, thereby proposing recommendations to improve the effectiveness of natural science teaching by the experience method.

**Keywords:** teaching methods; Teaching of Natural Science subjects; Experience method; Secondary schools; Ho Chi Minh City; Vietnam.

**1. Overview**

In teaching Natural Science (physics, chemistry, biology) according to the experiential method, teachers could use the following teaching methods: Group work; Problem solving; Plays; Game; Teaching by project; Participate in scientific research; Situation; Teaching by stations; Teaching by contracts; Practice; Experiment; Observation; Visual presentation. In fact, in the process of teaching Natural Science according to the experi-

ence method requires teachers to use multiple methods and assess the effectiveness of each method to adjust to improve teaching results.

**2. Object and method of survey**

We conducted a survey of 41 managers and teachers of Natural Sciences subjects and 346 students of 8th and 9th grade at secondary schools in Ho Chi Minh City, in term 2 of the school year 2018–2019, specific information is in the following Table 1:

*Table 1: List of secondary schools conducting surveys*

No	Schools
1	Phú Thọ Secondary school – District 11 – Ho Chi Minh city
2	Trần Quốc Toàn Secondary school – District 9 – Ho Chi Minh city
3	Phan Văn Trị Secondary school – District Gò Vấp – Ho Chi Minh city
4	Ngôi Sao Secondary – High school – District Bình Tân – Ho Chi Minh city
5	Nguyễn Hồng Đào Secondary school – District Hóc Môn – Ho Chi Minh city

The process of studying situation, obtained data and information are processed by the following ways:

- For close questionnaire

The survey questions about the status of organizing experience activities in teaching

natural science subjects at secondary schools are designed according to 5 levels, the lowest score is 1 and the highest point is 5. The research data is processed by calculating the average, significance level, and T-Tests test [3].

Table 2

**Convention on the processing of information on the status of teaching natural science subjects at secondary schools according to experimental methods**

Important level	Implemented level	Effective level	Encoding convention	Average score ( $\bar{X}$ )
Unimportant	Never/ Not implement	Least	1	From 1.00 to 1.80
Less important	Sometimes	Weak	2	From 1.81 to 2.60
Normal	Normal	Medium	3	From 2.61 to 3.40
Important	Usually	Good	4	From 3.41 to 4.20
Very important	Always	Very good	5	From 4.21 to 5.00

- For in-depth interview questions

Processing collected information through the process of analyzing each opinion, synthesizing, classifying the same and different responses, deeply analyzing the contents of the responses to prove the situation to withdraw the best results.

- For observation

Attending and recording comments about the information collected through observation, supplement information to assess the situation of organizing activities of experience in teaching Natural Sciences subjects more fully.

**3. Results of the survey on the status of using natural science teaching meth-**

**ods according to experiential methods in secondary schools in Ho Chi Minh City, Vietnam.**

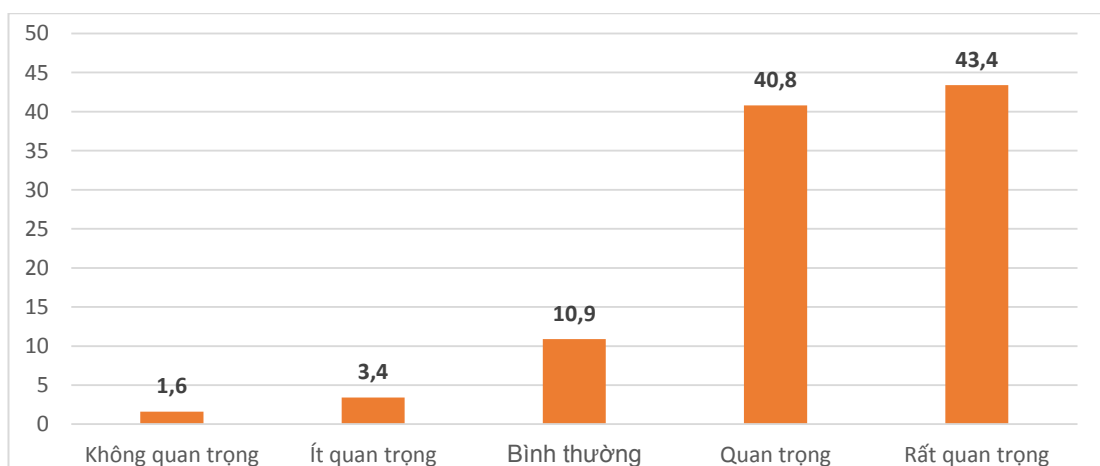
**3.1. Awareness of teachers and students about the role of organizing experience activities in the teaching of natural science at secondary schools**

Awareness is a particularly important factor that orients human activities. During the survey with a close questionnaire about the role of organizing experience in teaching Natural Science at secondary schools for teachers and students, the results are shown in Table 3 and table and displayed via the following figure 1.

*Table 3*

**Awareness of teachers and students on the role of organizing experience activities in the teaching of Natural Science at secondary schools**

No	Important level	Teachers and students		
		Quantity	Rate (%)	Average score ( $\bar{X}$ )
1	Unimportant	6	1.6	<b>4.21</b>
2	Less important	13	3.4	
3	Normal	42	10.9	
4	Important	<b>158</b>	<b>40.8</b>	
5	Very important	<b>168</b>	<b>43.4</b>	
<b>Total</b>		387	100	



**Figure 1. Awareness of teachers and students about in secondary schools about the role of natural science teaching by the experience method**

Statistical results show that: With average score = 4.21, it could be concluded that most teachers and students highly appreciate the importance of organizing experience activities in the teaching of natural science subjects at secondary schools currently. Specifically, 43.4 % of teachers and students believe that the organization of experience in the teaching of natural science subjects at secondary schools today is "Very important" and 40.8 % considered "Important" [2]. This result is a positive signal, demonstrating positive awareness of teachers and students in

organizing experience activities in the teaching of natural science subjects. However, there are still 06 teachers or students assessing the level of "Unimportant" and 13 managers and teachers assess the "Less important" level. This is an insignificant amount but shows that teachers and students still lack interest in the role of organizing experience in the teaching of natural sciences in a small part of the school.

Interviewing many natural science teachers, "Teaching in the recent experience method has been interested by researchers in

the world and Vietnam and given out many specific instructions for teachers who directly stand class could be easily applied. Through the research of teaching according to the experience method and the reality of the natural science teaching program, teachers found that teaching this subject according to experience method is an essential and important way to form and develop capacity as well as promoting positive student learning". On the other hand, when interviewed, many students also assessed that "teaching by experience method helps us have the opportunity to interact with things, close phenomena, and discover scientific knowledge. learn the connection between learning and practice, emotions that are much more interesting and attractive than the traditional way of learning, as teachers present and students only listen, take notes, so that when teachers experien-

tially use teaching, students find that there are lots of new and exciting new things". Thus, in general, the awareness of teachers and students about the role of natural science teaching according to the experience method is very good. This is an important foundation for teachers to use teaching methods aimed at giving students experiences in natural science teaching [6].

**3.2. Current status of implementation and effectiveness using the experience methods in the teaching of natural science subjects**

The survey results of the questionnaire on teachers 'and students' evaluation of the level of performance and the effectiveness of using the experience methods in the teaching of natural science subjects are shown in the following Table 4.

Table 4.

**Performance and effectiveness level of user experience methods in the teaching of natural science subjects**

No	Organizational methods for students	Implementation level		Level of significance	Effective level		Level of significance
		Average score			Average score		
		Teachers	Students		Teachers	HS	
1	Group work	4.00	3.58	0.00	3.95	3.91	0.77
2	Problem-solving	3.95	3.47	0.00	3.85	3.73	0.27
3	Plays	3.00	2.34	0.00	3.25	2.79	0.00
4	Game	3.46	2.99	0.01	3.54	3.32	0.14
5	Teaching by project	3.22	3.39	0.30	3.32	3.51	0.27
6	Participating in scientific research	3.05	2.89	0.40	3.20	3.14	0.76
7	Cases	3.51	2.94	0.07	3.51	3.19	0.03
8	Teaching by station	2.54	2.62	0.64	2.66	2.78	0.47

9	Teaching by contract	2.54	2.60	0.71	2.63	2.82	0.24
10	Practice	4.02	3.88	0.30	3.95	3.95	0.97
11	Experiment	4.15	3.20	0.00	4.15	3.44	0.00
12	Observation	4.22	3.17	0.00	4.05	3.33	0.00
13	Visual presentation	4.12	2.96	0.00	3.93	3.11	0.00
<b>Average score</b>		<b>3.52</b>	<b>3.08</b>		<b>3.54</b>	<b>3.31</b>	

Analysis of statistical results shows that: Experimental methods in the teaching of natural sciences are evaluated by teachers, "Regularly" (3.5BC) and achieving "Fair" effectiveness (Average score is 3.54). Meanwhile, students commented on the level of implementation of the above experience methods taking place at the level "Normal" (Average score is 3.08) and achieving the "Average" effect (Average score is 3.31).

**Using the test of T-test shows:**

- There is no significant difference in the evaluation of teachers and students at both performance level and effectiveness level (Values are greater than 0.05) for the following methods: Teaching by project, participating in scientific research, teaching by the station, teaching by contract, practice. Specifically:

+ For the method of "Teaching by the project": At the implementation level, with GPA of 3.22 and 3.39 respectively, showing the agreement in the evaluation of teachers and students, the method takes place at the level "Normal ". At the level of efficiency, teachers said that this method achieves "average" efficiency (GPA: 3.32) and students evaluate the effectiveness at "Fair" level (GPA: 3.95). Through interviews about the causes of this result, most teachers said: "Teaching by project is very suitable for the contents of natural science that needs to be taught to students, however, this is the method to proceed highly effective, requiring teachers and students to invest a lot of time,

effort and even finance, so using this method in the current school conditions is only moderate". Through observations and project hours, we all found that students love and actively participate in learning with this method.

+ For the method of "Participating in scientific research": Teachers and students all said that the implementation level of this method reached "Normal" level (GPA of 3.05, 2.89 respectively) and the level of effectiveness reached "Average" (GPA is 3.2, 3.14 respectively). The method of organizing for students to participate in scientific research has been interested and used by high schools in Vietnam in recent years [5]. Interviewing students in grades 8 and 9, who are taught by this method, the students mostly focus on: *"Learning through scientific research helps them develop good thinking, explore, discover and develop creativity. However, now this method takes too much time and effort, while the study program is heavy, students have limited time and must solve many learning tasks, so the implementation results are not good. Besides, not every lesson can hold scientific research, so teachers also use it at a moderate level"*.

+ For the method of "Teaching by station" and "Teaching by contract": Regarding theory, teaching by the station is a teaching method whereby students perform different tasks at specific positions in the classroom space, but the same direction to occupy a

learning content in different learning styles. In the current teaching conditions, we can understand the teaching method under contract is a learning activity in which each student group is assigned a package contract that includes different mandatory and optional tasks in one certain period. The active and independent student groups decide on the time for each task and the order of implementing those tasks according to the ability of the student group and the contract with the teacher. Both of these methods are unanimously evaluated by teachers and students at "Less implementation" (GPA ranges from 2.54 to 2.62) and achieve efficiency only at "Medium" level (GPA ranges from 2.63 to 2.82). In-depth interviews with teachers all said that to implement contractual teaching, teachers are the ones who design and build learning tasks in contracts and instruct students to study contracts, sign contracts and implement present the contract according to the capacity, level, and pace of learning of each individual to achieve teaching objectives.

+ *For the "Practice" method*: Teachers and students agree to evaluate this method occurring at "Regular" level (GPA of 4.02, 3.88 respectively) and efficiency achieved at "Pretty" level (GPA of Teachers and students are 3.95).

There are significant differences in the evaluation of teachers and students on the level of performance and effectiveness (P values of 0.05 or less) for the following methods: Experiment, observation, visual presentation. Teachers assess the performance and effectiveness of these methods higher than the students' assessment. Specifically:

+ *For the "Experiment" method*: Teacher said that this method is used "Regularly" (GPA: 4.15) and achieved a "Fair" effect (GPA: 4.15). Meanwhile, students think that the implementation level of this method is at "Normal" (GPA: 3.20) and achieved a "Fair" effect (GPA: 3.44). For natural science subjects such as Physical, Chemistry, Biology, the experiment is a method that can be used a lot in the teaching process. It can be said that

the performance frequency of teachers and students is different, but the effectiveness of this method is unanimously evaluated at "quite good" level. This shows that teachers need to practice to be able to use the method in the best way, bringing the most effective experience teaching. Discussing with teachers who teach natural science about the reason for low use of laboratories, the main opinion is that: *there is a shortage of materials, chemicals, technical facilities, safety, lost time to prepare... These are the main reasons that teachers are reluctant to choose experimental methods for students to experience.*

+ *For the method of "Observation"*: Teacher said that this method is used "Very often" (GPA: 4.22) and achieved "Quite good" effect (GPA: 4.05). Meanwhile, students believe that teachers use this method at the level of "Normal" (GPA: 3.17) and the effect is achieved at the "Average" level (GPA: 3.33). Observation is also a method commonly used in natural science, the way that teachers organize and guide students to independently observe things, phenomena, thereby drawing lessons and form new knowledge for students. Surveying data shows that students have not felt the presence and effectiveness of this method as teachers have evaluated.

+ *For the method "Visual presentation"*: This is a method of the group of visual teaching methods, has a close relationship, is separated from the "Observation" method. "Visual presentation" is also one of the methods that teachers often use in organizing teaching and learning of natural science subjects. The visual presentation is the way that teachers present lesson content based on visual means. If teachers assess this method to take place at the "Regular" level and achieve the "Fair" effect (GPA is 4.12, 3.93 respectively), then the students think that this method takes place at "Normal" and achieving an "average" effect (GPA is 2.96, 3.4 respectively) [3].

To understand the correlation between the performance level and the effectiveness of user experience methods in the teaching of

natural science subjects at secondary schools, the team used the Pearson Correlation Coefficient. Results are presented in Table 5

According to Table 5, there is a correlation between the level of performance and the level of effectiveness of user experience methods in the teaching of natural science subjects at sec-

ondary schools at the significance level of 0.01. This proves that if the method of experience in the teaching of natural science subjects occurs, the results will be higher. The correlation values show a high, very reliable relationship ( $0.80 < r = 0.834 \leq 1$ ).

*Table 5*

**Correlation coefficients between performance levels and the effectiveness of user experience methods in the teaching of Natural Sciences subjects at secondary schools**

Organizational methods for students	Significance level (p)	Correlation Pearson (r)
Performance level	0.000	0.834**
Effectiveness level		
** . The correlation has the significance level of 0.01		

**4. Conclusion**

Teaching in the way of experiencing in Natural Science Subjects at the secondary level of Vietnam in general and Ho Chi Minh City, in particular, is becoming a problem that researchers, educational managers, teachers, students, and parents pay attention and focus on investment. This is a trend of teaching though not new in the world but in the context of educational innovation in Vietnam is a step forward in changing awareness as well as the attitude and behavior of teachers about teaching. Through the process of studying the status of implementation and effectiveness using teaching methods of experience in Natural Sciences Subjects, we found that this is a problem that teachers have used at a relatively good and high effective level. However, there are still many issues that need to be resolved to bring about the expected results. The survey results are an important and special basis with high significance to help managers and teachers have investment to overcome the limitations and at the same time have a plan to foster teachers. To teach natural science subjects according to the method of experience, especially when

applying the new general education program approved on December 26, 2018, is officially deployed.

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