TEACHING MATHS IN ORDER TO DEVELOP SECONDARY SCHOOL STUDENTS' ABILITY IN THE NORTHERN MOUNTAINOUS AREA OF VIETNAM

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ABSTRACT

Mathematics has more and more applications in life, basic mathematical knowledge and skills have helped people solve real-life problems systematically and accurately, contributing to promoting society. development association. Mathematics at lower secondary schools contributes to the formation and development of the main qualities, general competence and mathematical competence of students; develop key knowledge and skills and create opportunities for students to experience and apply mathematics in practice; make connections between mathematical ideas, between mathematics and practice, between mathematics and other educational subjects and activities, especially with science, natural sciences, physics, chemistry Science, Biology, Technology and Informatics to implement STEM education. Math content is usually logical, abstract and general. Therefore, in order to understand and learn Math, the Math program in high schools needs to ensure a balance between "learning" knowledge and "applying" knowledge to solve specific problems. In the process of learning and applying mathematics, students always have the opportunity to use modern technological means and teaching equipment, especially electronic computers and handheld computers to support the performance process, exploring, discovering knowledge and solving math problems. The article compares research results and applies survey results to assess the importance of mathematics for junior high school students, especially in the northern mountainous region of Vietnam.

Keywords: maths, importance, education, secondary school students

I. INTRODUCTION

Teaching is a process of interaction and collaboration between teachers and students towards a common goal, which is to develop students' abilities and for the progress of students [1].Mathematics teaching is a process organized in a purposeful and planned manner by the teacher in which, under the role of organizing, directing, guiding and controlling the teacher, students are self-disciplined and active. actively and self-organizing learning activities in order to form and develop the general quality of competence and to form and develop students' mathematical competence [2].

II. RESEARCH CONTENT

2.1. Theoretical basis of teaching Mathematics in the direction of developing students' ability in secondary schools

Teaching Mathematics in the direction of developing students' competencies in secondary schools is a purposeful, planned process organized based on the model of competence to be achieved in students in the process of teaching Mathematics, teaching and learning. teachers design and organize and control the learning process of students, as well as evaluate the results based on ability to achieve the goal of forming quality, general competence and specific competence in math in students [3].

i) Objectives of teaching Mathematics in the direction of developing students' competencies in secondary schools: Forming and developing common qualities and abilities for students to be independent and confident in life, and at the same time forming Mathematical competence for students with the implementation of the requirements to be achieved: State and answer questions when reasoning, solving problems, making logical arguments when solving problems, proving mathematical propositions are not too complicated; Can use mathematical formulas, algebraic equations, representations, etc. to describe situations that appear in some practical problems that are not
too complicated; Use mathematical language in combination with common language to express mathematical content as well as demonstrate evidence, methods and results of arguments; Present ideas and ways to use mathematical tools and means to perform a learning task or to express mathematical arguments and proofs [2].

ii) The content of teaching Mathematics in the direction of developing students' ability in secondary schools: The content of teaching Mathematics revolves around three knowledge circuits: Numbers, Algebra and Some elements of analysis; Geometry and Measurement; Statistics and Probability. Teaching content includes the most necessary system of mathematical concepts, principles and rules for everyone, as a foundation for learning at the next learning levels or can be used in life. Daily [4].

iii) Methods of teaching Mathematics in the direction of developing students’ ability in secondary schools: Math teaching methods are used in accordance with the cognitive process of students (going from concrete to abstract, from easy to difficult or the other way round); Math teaching methods need to be used in combination between traditional teaching methods and modern teaching methods in order to effectively exploit students’ knowledge and experience including: Teaching problem solving; project-based teaching; case study teaching; situational teaching; teaching associated with experience, etc. to develop students' general capacity, mathematical thinking, and mathematical communication capacity (speaking, writing and performing mathematics) for students [1].

iv) Organizational form of teaching Mathematics in the direction of developing students' ability in secondary schools: Teachers can diversify forms of teaching mathematics: teaching the whole class; experiential teaching; teaching in the direction of STEM education; teach self-study; teaching through the Elearning environment etc.

v) Examining and evaluating the results of teaching Mathematics in accordance with the orientation of developing students' competence in secondary schools: Evaluation of the results of teaching Mathematics must be based on the competency standards that need to be formed in students and associated with the context of the curriculum. specific scene; Coordinate between regular assessment and periodical assessment, attach importance to assessing students' progress; Assessment must ensure comprehensiveness, objectivity, categorization and have a motivating effect to help teachers and students adjust teaching and learning in a timely manner [4].

2.2. The current situation of teaching Mathematics in the direction of developing students' ability in junior high schools in the northern mountainous region of Vietnam

2.2.1. Survey organization

The purpose of the survey: To evaluate the current situation of teaching Mathematics in the direction of developing students' ability in junior high schools, analyze the causes, and propose measures to improve the quality of teaching Mathematics [5].

Subjects and content of the survey: The subjects of the survey were 236 administrators and teachers of Mathematics in secondary schools of 3 provinces: Ha Giang, Yen Bai and Thai Nguyen.

Survey method and data processing: The research team conducted a survey using a questionnaire, combined with a study of the teachers' teaching records, the results obtained were processed according to the following levels: Score 5 ranked at the highest level. Very good or Very often or Very influential; Score 4 at Good or Frequent or Influential; Score 3 at Fair or Infrequent or Relatively influential; Score 2 as Moderate or Rarely or Less Affected; Score 1 at Weak or Unused or Unaffected. How to process data with the following levels: The average score is obtained as follows: From 1.0 to 1.80 at a completely unaffected level; unfulfilled; weak; From 1.80 to close to 2.60 at a very low level of influence, rarely performed, on average. From 2.60 to close to 3.40 in relative influence; sometimes done; rather. From 3.40 to close to 4.20 in influence level; regularly performed; good; From 4.20 to 5.0 at very impact; very often; very good.

2.2.2. Research results and discussion

i) The current situation of content of teaching Mathematics in secondary schools

Table 2.1 The content of teaching Mathematics has been implemented in the direction of developing students' capacity in junior high schools in the northern mountainous provinces

<table>
<thead>
<tr>
<th>Teaching content</th>
<th>Performance level</th>
<th>Average score</th>
</tr>
</thead>
</table>

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Table 2.1 shows that the content of teaching Mathematics in the direction of student capacity development in secondary schools in the Northern mountainous area is not synchronized in the content with the average score as follows: The content of teaching theory, Math exercises by lesson, is rated the highest with an average score of 4.91 points, which is very good. This is easily explained because according to the current program, teachers often have to perform the content. The content of teaching Mathematics is subject to subject integration with an average rating of 4.56 points at a very good level [6]. The content of teaching Mathematics in the direction of differentiation with the average assessment score of 3.23 points at a good level; The content of teaching Mathematics that is assessed by management staff and teachers to be performed at a low level is only average: Teaching Mathematics by interdisciplinary subject with an average assessment score of 2.58 points, reaching the average level. Teaching Mathematics in an experiential way with an average rating of 2.96 points; Teaching Mathematics in the direction of STEM Education with an average assessment score of 1.93 points is average [7].

Talking with the teacher of Math at Minh Khai Secondary School, the author learned that the teacher has not organized the teaching content in the form of experiential learning and teaching in the direction of STEM education because of the limited capacity of the lesson design, there is no coordination among teachers to design and organize teaching; on the other hand due to the financial constraints of the schools;

Comments: The content of teaching Mathematics in the direction of developing students' ability has been implemented, but it is still limited in some contents: Teaching Mathematics by interdisciplinary topics; Teaching Mathematics in an experiential way; Teaching Mathematics towards STEM Education; The cause of the situation is that teachers are still limited in teaching capacity to implement the above contents and the school still has difficulties in finance and facilities [3].

**ii) The current situation of teaching methods in Mathematics**

Table 2.2 Methods of teaching Mathematics in the direction of developing students' ability in secondary schools in the northern mountainous region of Vietnam

<table>
<thead>
<tr>
<th>Teaching method</th>
<th>Performance level</th>
<th>Average score</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>1. Project teaching method</td>
<td>10</td>
<td>36</td>
</tr>
<tr>
<td>2. Problem-solving teaching methods</td>
<td>230</td>
<td>6</td>
</tr>
<tr>
<td>3. Study teaching method</td>
<td>190</td>
<td>20</td>
</tr>
<tr>
<td>4. Experiential teaching method</td>
<td>10</td>
<td>56</td>
</tr>
<tr>
<td>5. Presentation method</td>
<td>140</td>
<td>62</td>
</tr>
<tr>
<td>6. Group discussion method</td>
<td>130</td>
<td>60</td>
</tr>
<tr>
<td>7. Case Study Methods</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8. Other Methods</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Table 2.2 shows that Mathematical teaching methods oriented towards student capacity development in secondary schools in the Northern mountainous area have been implemented, but some methods dominate in teaching and developing students' competence. Student resources have not been used on a regular and very regular basis. Teaching methods used by teachers on a very regular basis include: Group Discussion method with
an average score of 4.36 points; The problem-solving teaching method is assessed at the Regular level, the average score is 4.97 points, proving that the two methods 1 and 2 are used by schools very often and give good results in teaching mathematics. Methods: Teaching method according to the situation; Presentation method; Project teaching methods; the case study method. These methods are used by schools with varying degrees of use, some teachers use them very often, some schools use them frequently, and some schools rarely use this method [4]. The experiential teaching method is associated with reality, applied by schools to a very different extent depending on the conditions of the school wall, especially some schools have not used this method because the conditions do not allow to conduct educational activities according to this method, which are schools in disadvantaged areas of Tran Yen district, Yen Bai province.

iii) Organizational form of teaching Mathematics:

Table 2.3 Organizational form of teaching mathematics according to the orientation of student capacity development in secondary schools in the northern mountainous region of Vietnam

<table>
<thead>
<tr>
<th>Organizational form of teaching Mathematics in the direction of capacity development</th>
<th>Performance level</th>
<th>Average score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Teach the whole class</td>
<td>5</td>
<td>236</td>
</tr>
<tr>
<td>2. Teaching in groups</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>3. Individual teaching</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>4. Teaching through the E-learning environment</td>
<td>2</td>
<td>200</td>
</tr>
<tr>
<td>5. Teaching Math in the form of experience</td>
<td>1</td>
<td>220</td>
</tr>
<tr>
<td>6. Other forms of organization</td>
<td>4</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 2.3 shows two forms of teaching organization used by teachers very often: Whole class teaching, group teaching with an average score of 5.0 points on a very regular basis. Individual teaching is the form that is evaluated in terms of infrequent and infrequent use, with an average score of 3.23 points. There are two other forms: Teaching Math in the form of practical experience and Teaching through the E-learning environment, which are evaluated at a rarely used level and even more teachers have not used it, without a rating card at the Regular level. To find out the reason, the author interviewed teacher H at the secondary school in Tran Yen district, Yen Bai province, the teacher said that in order to organize experiential teaching related to the school's facilities and finances, this is not current mountainous schools have many limitations; As for online teaching, schools and teachers can meet the requirements, but highland students do not have the means to study online, so there are many limitations [7].

Comment: Basically, the form of organization of teaching Mathematics in the direction of developing students' ability in secondary schools in the northern mountainous region of Vietnam has been diversified by teachers; in which the forms of teaching organization are frequently used by teachers, which are: Whole-class teaching; form of group discussion organization; forms of teaching organization in the form of: Teaching through the E-learning environment; Teaching Mathematics in the form of practical experiences are forms of teaching organization that have not been used regularly by teachers due to various reasons such as poor infrastructure conditions; teaching capacity of teachers, etc.

iv) Test - evaluate the results of teaching Mathematics in the direction of student capacity development in junior high schools in the northern mountainous region of Vietnam

Table 2.4 Testing and evaluating the results of teaching Mathematics in the direction of student capacity development in secondary schools in the northern mountainous region of Vietnam
Table 2.4 shows two forms and methods of testing and evaluating the results of Mathematics teaching in the direction of student capacity development in junior high schools in the northern mountainous area, which are flexibly applied to students. Each school, but for the form of assessment combined with objective test and essay, which is applied very often by the schools, shown by the survey results reaching 100%, the assessment is at the Very frequent level with The average score is 5.00 points. Evaluation of the results of practice, experiments, and implementation of learning projects is a form of assessment of learning outcomes that has not been conducted by math teachers with an average score of 1.97 points and 1.93 points rarely performed [8].

Comment: The assessment of math learning outcomes in the direction of student capacity development has been interested by math teachers in secondary schools, however, some forms of assessment of results associated with capacity assessment have not been done yet and regularly evaluated by math teachers, including: Assessment through practice, experiments, results of implementation of learning projects; Situational assessment with context [5].

### 2.3. Proposed measures to improve the quality of teaching Mathematics in the direction of developing students' ability in secondary schools

i. Improving teaching capacity in the direction of developing math teaching capacity for math teachers in secondary schools: ability to develop lesson plans and topics; the ability to apply methods and forms of teaching organization in the direction of active student activities; ability to evaluate learning results in Mathematics; (ii). Design and organize the implementation of the process of teaching Mathematics in an experiential way in order to develop students' capacity: Step 1: Determine the required competency requirements; Step 2: Design content of learning activities, content of learning activities can be designed according to projects associated with students' experiences at production and business establishments to solve lesson tasks; Step 3: Organize the implementation of student learning projects in groups; Step 4: Students represent the groups to report on project products, teachers synthesize, systematize knowledge, lesson skills and comment on mental evaluation, attitude, and results of project groups. ; (iii). Cooperation between teachers in groups, professional groups to design and organize effective lessons; (iv) Coordinating between schools, families, and business establishments to enhance experiential teaching and teaching in the form of STEM for students. (v). Strengthening physical and financial facilities to support means of teaching Mathematics for teachers [9].

## III. CONCLUSION

Teaching Mathematics with the orientation of developing student's capacity in secondary schools is a modern teaching approach that needs to be widely applied to develop students' competencies according to the teaching objectives in secondary schools. Teachers need to participate in fostering and self-improvement to improve their ability to teach Mathematics in the direction of competency development, secondary schools need to have coordination between math teachers in groups, professional groups and between Math teachers and Natural Science and technology teachers to design and organize lessons. Schools need to coordinate with family and society to organize experiential math teaching, STEM education and ensure the conditions of physical and financial facilities for math teachers to carry out effective teaching activities.

## REFERENCES


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