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Research on Problem-Solving Skills in Da Nang High School Students

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ABSTRACT

Problem-solving skills play a particularly important role in studying and working. Therefore, it becomes essential to develop problem-solving skills for students in schools. The purpose of this project is to understand the current situation and level of problem-solving skills in high school students, the relationship between grade level factors and gender and problem-solving skills, thereby proposing some appropriate problem-solving improvement measures for high school students in Da Nang City.

KEYWORDS: problem-solving skills, student, secondary, pressure level

I. INTRODUCTION

Problem solving skills are the ability to handle and make decisions when encountering unexpected situations. The research team found that problem-solving skills in students are currently not good. *The study on problem-solving skills of high school students in Da Nang City* is a practical project of the research team to understand the current status of problem-solving skills, the relationship between gender, grade level and problem-solving skills, from there, propose some solutions to help improve problem-solving skills in students.

II. ORGANIZATION AND RESEARCH METHODOLOGY

- The study was conducted on **308** high school students in Da Nang City, specifically as follows:

Criteria	School			Grade			Gender	
	Phan Chau Trinh	Nguyen Thuong Hien	FPT	10	11	12	Female	Male
Quantity	82	117	109	84	102	122	175	133
Percent (%)	26.6	38	35.4	27.3	33.1	39.6	56.8	43.2
Total	**308**							

- The research uses methods including: document review, survey by questionnaires, and statistical analysis.
- The questionnaire next to the respondents' personal information is Problem - Solving Inventory (PSI) (35 items) developed by Paul Heppner, Chris H. Petersen with the 6-step Likert scale: 1= *totally agree*; 2= *partially agree*; 3= *Slightly agree*; 4= *slightly disagree*; 5= *Partial disagreement*; 6= *strongly disagree*.

The structure of problem-solving skills includes: Problem-solving confidence (11 items); Approach- avoidance styles (16 items); Personal Control (5 items).

III. RESEARCH RESULTS

A. Definitions and structures of problem solving skills

1) Definitions:

Problem-solving skills are the skills of applying personal knowledge and understanding to be able to understand and come up with a solution to a problem that we face.

2) Structures:

Problem-solving skills have core aspects such as:

- *Problem-solving confidence*: the confidence of each individual when facing obstacles.

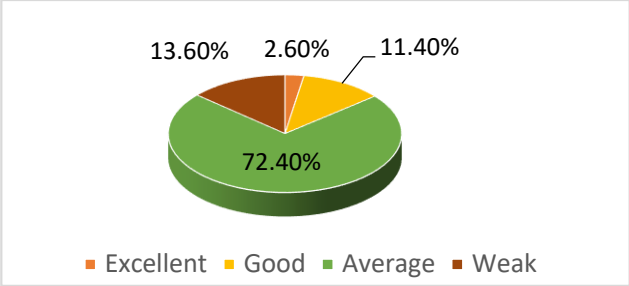
- *Approach- avoidance style*: the way each person approaches and perceive problems.

- *Personal control*: the way to control the direction of behavior and emotions when facing problems.

B. The reality of problem solving skills in Da Nang City high school students

1) The level of problem solving skills:

The level of problem-solving skills of Da Nang high school students is determined by descriptive statistics. The results give the average value M= 104.54, standard deviation Std= 18.397, minimum value Min= 32, maximum value Max= 162.



There are 2.6% of students with excellent problem solving skills, 11.4% of students at good level, 72.4% of students at average level and 13.6% of students at weak level. The results show that the majority of Da Nang high school students have average problem-solving skills.

2) The relationship between gender and age factors with students' problem-solving skills:

Table II. GENDER-BASED PROBLEM-SOLVING SKILLS

Gender	N		Mean (M)	Std. Dev. (SD)
Male	133	43.19%	3.29	0.68
Female	175	56.81%	3.25	0.47

Independent-Samples Test Analysis is to verify the average difference in problem-solving skills of students in different genders gives the coefficient Sig = 0.027 < 0.05. So there is a statistically significant difference in problem solving skills of students of different genders, female students have better problem solving skills than male students.

Table III. PROBLEM SOLVING SKILLS ACCORDING TO GRADE LEVE

Grade	N		Mean (M)	Std. Dev. (SD)
10	84	27.27%	3.24	0.52
11	102	33.11%	3.31	0.58
12	122	39.62%	3.26	0.61

The ANOVA One-Way Analysis is to compare the average level of problem-solving skills at different ages gives the coefficient Sig = 0.679>0.05 coefficient, the results show that there is no statistically significant difference in problem-solving skills of students in different grades.

3) Average score of all manifestations of problem-solving skills in students.

Table IV. AVERAGE SCORE OF ALL MANIFESTATIONS

No.	Manifestation	Mean (M)	Std. Dev. (SD)	Level	Rank
1	*Problem-solving confidence*	3.36/6	0.64	Average	2
2	*Approach- avoidance style*	3.22/6	0.63	Average	1
3	*Personal control*	5.33/6	1.29	Low	3
Problem-solving skills		**3.97**	**0.38**	**Average**	

(1= *Totally agree*; 2= *Partially agree*; 3= *Slightly agree*; 4= *Slightly disagree*; 5= *Partial disagreement*; 6= *Strongly disagree)*

The results show that most aspects of students' problem-solving skills are at an average level, with "*personal control*" at a low level. Therefore, problem-solving skills are best expressed in "*approach- avoidance style"* and lower in *"personal control"*.

Table V. PROBLEM-SOLVING CONFIDENCE

No.	Students' problem-solving confidence manifestations	Mean (M)	Std. Dev. (SD)	Rank
1	*I can often think of many other creative and effective ways to solve a problem.*	3.44	1.21	7
2	*I am able to solve most problems even if I cannot think of any solutions at first.*	3.36	1.19	6
3	*Many problems I face are too complicated for me to solve.*	3.08	1.18	1
4	*I make decisions and am satisfied with them later*	3.47	1.08	9
5	*When I plan to solve a problem, I'm almost certain I can do it.*	3.45	1.11	8
6	*If give enough time and effort, I believe I can solve most of the problems that stand in my way.*	3.78	1.18	11
7	*When faced with unprecedented problems, I am confident that I can solve the problems that may arise later.*	3.12	1.14	2
8	*I believe I can solve new and difficult problems.*	3.26	1.18	5
9	*After making a decision, the result I predicted is usually true to the actual one.*	3.22	0.98	4
10	*When I am stuck with a problem, I'm not sure if I can solve it*	3.20	1.04	3
11	*When I realize a difficulty, one of the first things I did was try to figure out where the problem is.*	3.60	1.07	10

(1= *Totally agree*; 2= *Partially agree*; 3= *Slightly agree*; 4= *Slightly disagree*; 5= *Partial disagreement*; 6= *Strongly disagree)*

Problem-solving confidence is most clearly expressed in students as "*Many problems I face are too complicated for me to solve"* (M=3.08). Meanwhile, "*If give enough time and effort, I believe I can solve most of the problems that stand in my way."* is less common in students (M=3.78). Therefore, many students do not feel confident in their ability to solve problems, even though in fact their problem-solving skills are not too bad.

Table VI. APPROACH AVOIDANCE STYLE

No.	Students' approach avoidance style manifestations	Mean (M)	Std. Dev. (SD)	Rank
1	*When a solution to a problem doesn't work, I don't find out why it doesn't work.*	2.90	1.29	3
2	*When I'm challenged with a complex problem, I don't bother to develop a strategy to gather information for figuring out specifically what the problem is.*	2.79	1.14	1
3	*After solving the problem, I don't analyze what's going in the right direction and what's going wrong*	2.89	1.20	2
4	*After I have tried to solve the problem with a particular process of action, I stop and compare the final result with what I expected.*	3.41	1.09	13
5	*When I have a problem, I will think of as many solutions as I can.*	3.47	1.08	15

6	*When problems get in the way, I constantly check my emotions to figure out what happened in the situation.*	3.35	1.12	10
7	*When I have a problem, I usually follow the first solution I think of.*	3.30	1.12	8
8	*When deciding on an idea or a possible solution to a problem, I often don't take the time to consider the possibility of other alternatives succeeding.*	3.11	1.16	6
9	*When I get stuck with a problem, I stop and think about it before deciding on the next step.*	3.45	1.13	14
10	*I usually solve problems by the first way I come up with them.*	3.59	1.47	16
11	*When making decisions, I consider the consequences of each solution and compare them with each other.*	3.37	1.11	11
12	*I try to predict the general result of taking a particular process of action.*	3.34	1.05	9
13	*When I tried to think of possible solutions to the problem, I couldn't think of many alternatives.*	3.09	1.07	5
14	*I have a systematic approach to comparing solutions with each other and making choices.*	3.11	1.1	6
15	*When I am stuck with a problem, I often don't consider whether things from my surroundings are contributing to the problem.*	2.94	1.13	4
16	*When I'm confused by a problem, one of the first things I do is survey the situation and consider all relevant information.*	3.37	1.14	11

(1= *Totally agree*; 2= *Partially agree*; 3= *Slightly agree*; 4= *Slightly disagree*; 5= *Partial disagreement*; 6= *Strongly disagree)*

Students tend to "*When I'm challenged with a complex problem, I don't bother to develop a strategy to gather information for figuring out specifically what the problem is"* (M= 2.79) and "*After solving the problem, I don't analyze what's going in the right direction and what's going wrong"* (M= 2.89); The expression "*When I have a problem, I usually follow the first solution I think of."* is less common in students (3.59). Therefore, it can be seen that most students when solving problems are often not interested in searching information to find specific problems and often do not re-evaluate after solving the problem.

Table VII. PERSONAL CONTROL

No.	*Students' personal control manifestations*	*Mean (M)*	Std. Dev. (SD)	*Rank*
1	*When the first solution I came up with couldn't solve the problem, I became skeptical about my ability to solve the problem.*	3.17	1.16	2
2	*Sometimes I don't stop and take the time to solve my problems but only deal with the chaos that lies ahead*	3.20	1.08	3
3	*Even when I try to solve a problem, sometimes I feel like I'm groping and can't find the real cause.*	3.29	1.1	5
4	*I make quick decisions and then regret it.*	3.16	1.2	1
5	*Sometimes I'm emotionally driven and I can't consider more solutions to my problems*	3.26	1.2	4

(1= *Totally agree*; 2= *Partially agree*; 3= *Slightly agree*; 4= *Slightly disagree*; 5= *partial disagreement*; 6= *Strongly disagree)*

In terms of individual control when it comes to solving problems, the survey results show the expression " *I make quick decisions and then regret it"* (M = 3.16) and the tendency "*When the first solution I came up with couldn't solve the problem, I became skeptical about my ability to solve the problem*." (M = 3.17); The expression " *Even when I try to solve a problem, sometimes I feel like I'm groping and can't find the real cause*." is less common in students (M = 3.29). From this, it can be seen that most students when solving problems often make quick decisions and then regret them, as well as when they do not successfully solve problems, they tend to doubt their own abilities.

IV. CONCLUSION AND RECOMMENDATIONS

The results of the study show:

There were 2.6% of students with good problem-solving skills, 11.4% of students at good level, 72.4% of students at average level and 13.6% of students at weak level. The results show that the majority of Da Nang high school students have average problem-solving skills.

The expression of aspects of problem-solving skills in students is uneven, with certain disparities. The most visible aspect is "Approach-avoidance styles," and the least expressive aspect is "Personal control."

Common expressions of problem-solving skills among students are feeling that problems are often too complex to solve, not developing a strategy for gathering information to solve the problem, and often feeling regret after a decision has been made. Grade level factors do not affect students' problem-solving skills, gender factors do affect problem-solving skills.

To improve students' problem-solving skills, raising students' awareness is necessary: providing basic knowledge of definitions, steps needed to solve problems, and effective problem solving. The methods that the research team chose to help students improve their problem-solving skills included setting up a "Problem Solver" fan page on the Facebook app, developing a set of exercises, a set of practice questions, and developing an experimental program by developing scenarios for lessons. The school-planned classroom career experience program for individuals Be encouraged to observe and experience a variety of problems.

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